

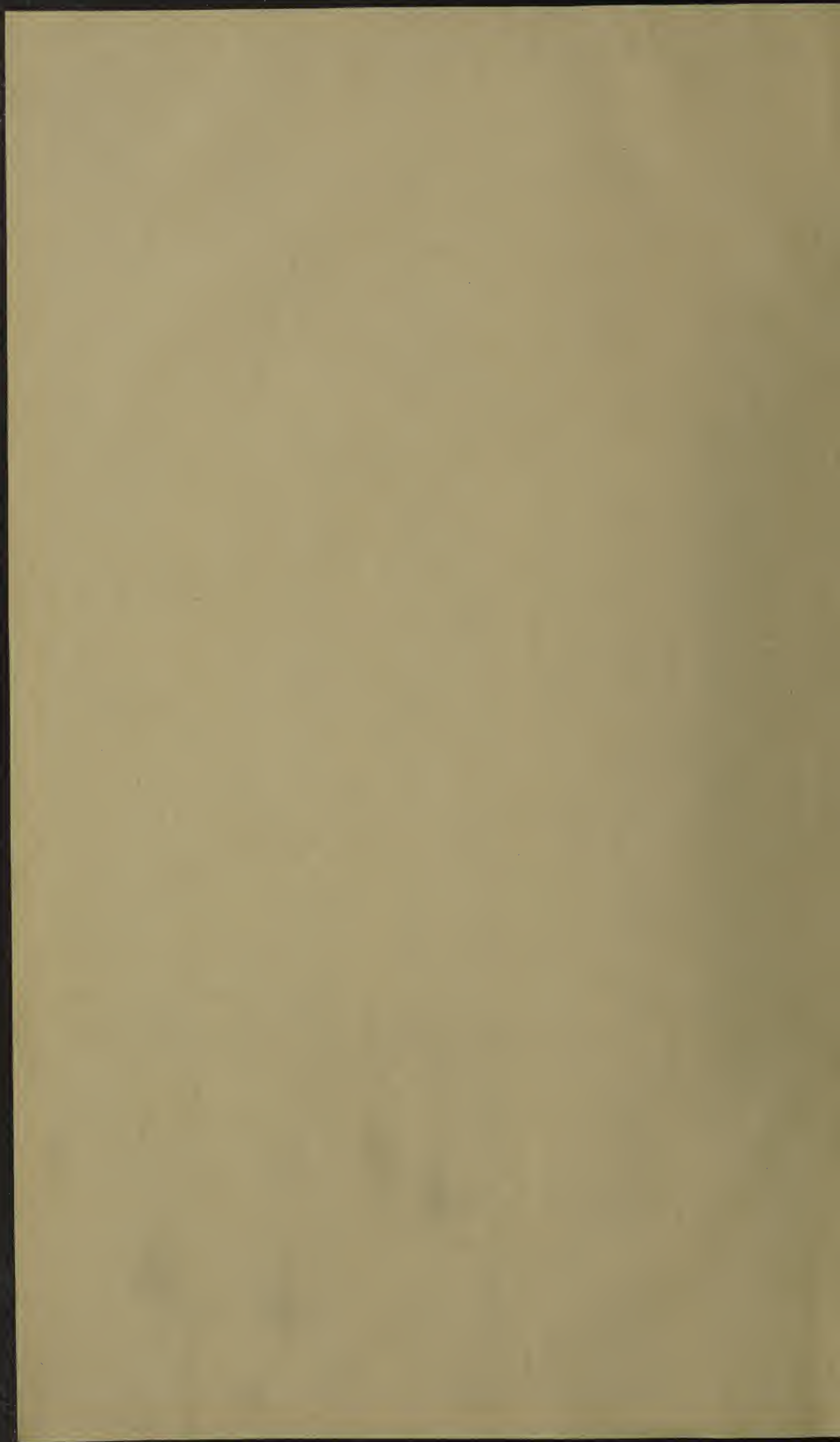


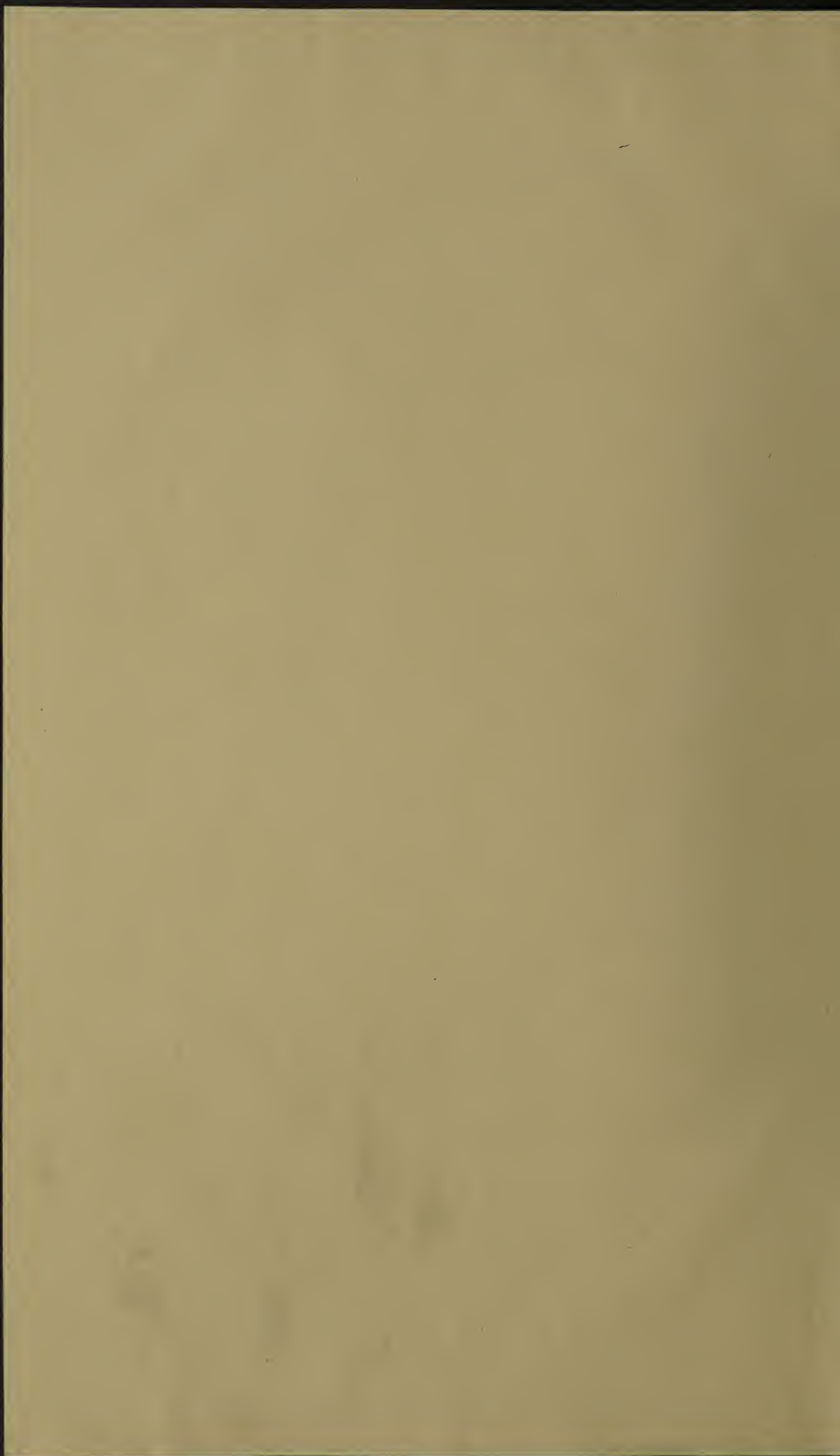


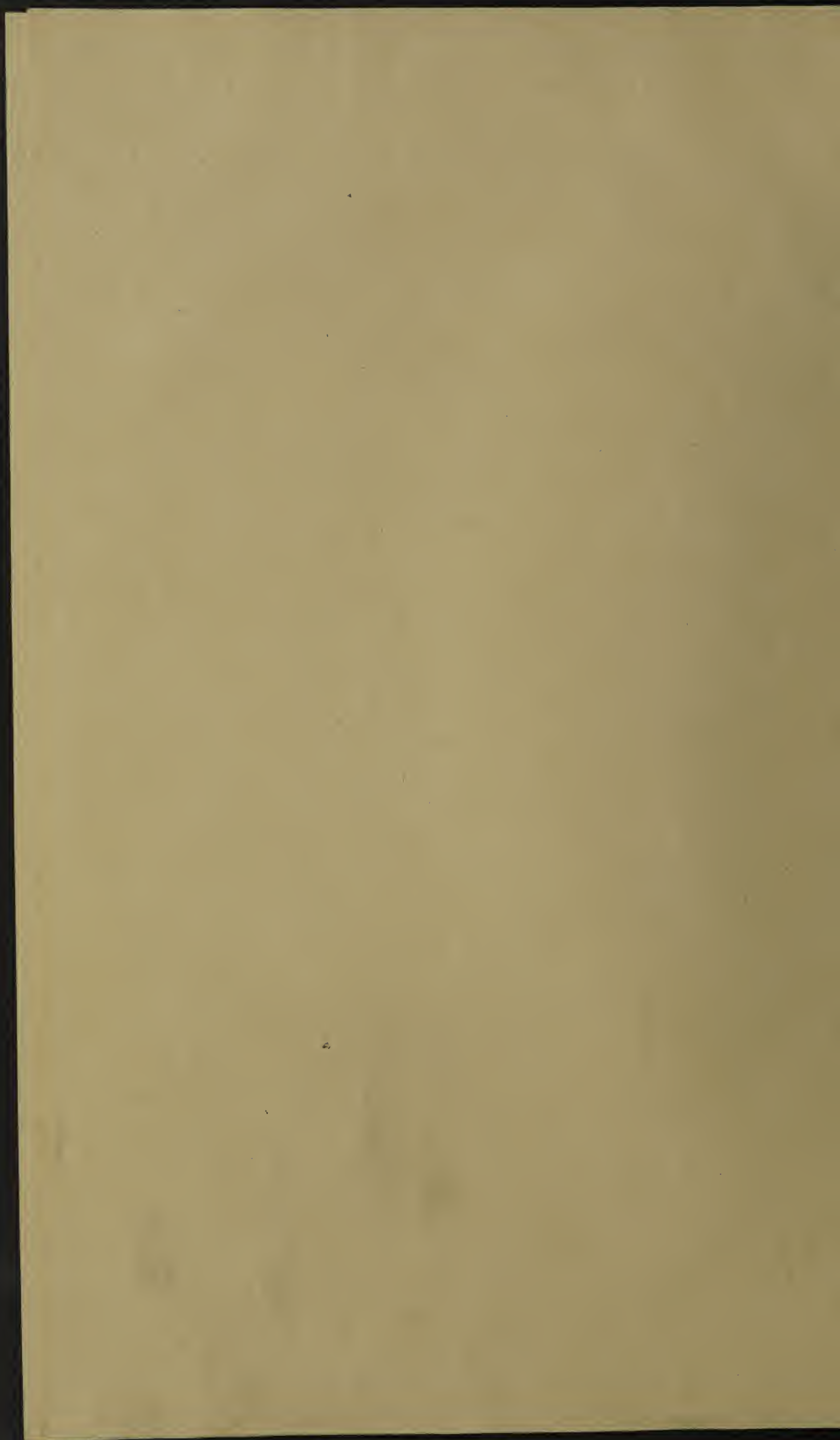


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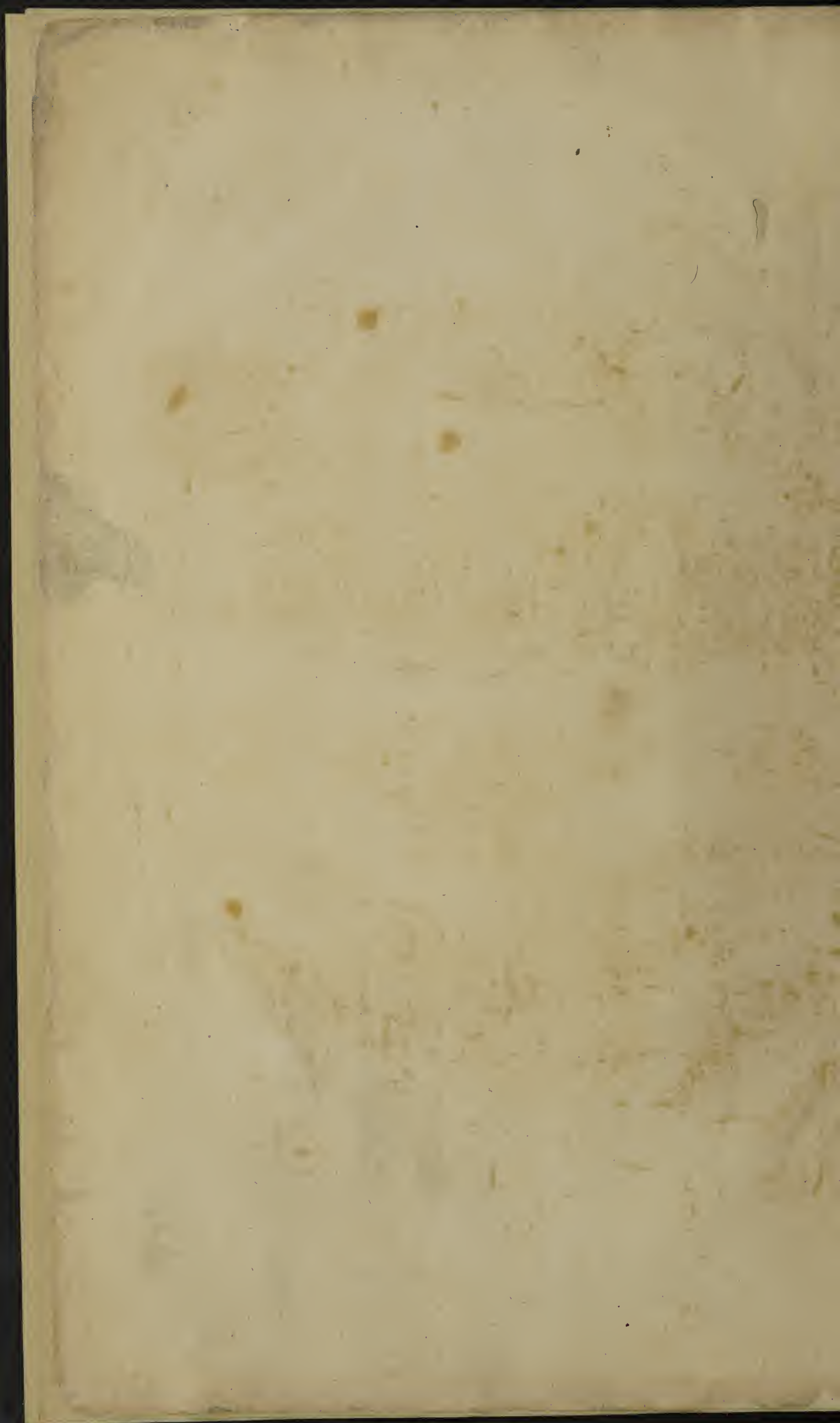






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DANIEL COLWALL Armiger.
Musæi Regalis Societatis Fundator.

MUSÆUM REGALIS SOCIETATIS:

OR, A

Catalogue and Description

Of the Natural and Artificial

RARITIES

Belonging to the

ROYAL SOCIETY,

And preserved at

Gresham Colledge.

M A D E

By *Nehemiah Grew*, M. D. Fellow of the *Royal Society*,
and of the *Colledge of Physitians*.

Whereunto is Subjoyned the

Comparative Anatomy

O F

Stomachs and Guts.

By the same AUTHOR.

L O N D O N,

Printed for *S. Holford*, at the *Crown* in the *Pall-Mall*, 1686.

ALBERTUS MAGNUS

A. 120

Commentarius in 4 libros

de animalibus et vegetabilibus

SEPTIMA

partitio

ROYAL SOCIETY

of London

Graham College

1888

Presented to the Royal Society of London
by the Rev. Canon J. H. Graham



Compendium Anatomiae

et Chirurgiae

per J. H. Graham

1888

Printed by J. H. Graham

TO THE
Most Illustrious
THE
ROYAL SOCIETY,
The following
CATALOGUE

IS
Most Humbly
PRESENTED

By the Author

NEHEMIAH GREW.

THE
MUSEUM OF
THE

ROYAL SOCIETY

CATALOGUE

OF THE
MUSEUM OF
THE

ROYAL SOCIETY

To his Honour'd Friend

Daniel Colwall Esq;

Fellow of the ROYAL SOCIETY.

S I R,



Nothing can be more fit, than to dedicate a Catalogue of that *Museum* to your Self, of which you are the Founder. You having, in your Devotion to the *Royal Society*, offered up to them That so noble an *Hecatombe*.

The truth is, I have herein prosecuted, what the *Royal Society*, by their Order for the making and publishing of this Catalogue, had begun: they having done the same, as with regard to Common Use; so to return that which is but Right to your Self, and that they might always wear this Catalogue, as the Miniature of your abundant Respects, near their Hearts.

Neither must your Voluntary Undertaking for the Engraving of the Plates for this Work, be unknown. You having done this, not only out of respect to my Self; but likewise in order to a Public Good; whereby you are a Benefactor to all Ingenious Men.

Besides the particular regard you had to the *Royal Society* it Self; which seeming (in the opinion of some) to look a little pale, you intended hereby,

The Epistle Dedicatory.

to put some fresh Blood into their Cheeks; pouring out your Box of Oyntment, not in order to their Burial, but their Resurrection.

To conclude, I have made this Address, not only to do You Right, but to do Right unto Virtue it self; and that having proposed your exemplary prudence unto others; they may from you, learn, To use the redundant part of their Estates, either to a Charitable end, as this City will witness for your Self; or the Promotion of Masculine Studies, as in the present Case: or other laudable ways, so as with you, to merit a lasting esteem amongst the wiser and better part of Mankind.

I am,

Sir,

*Your very humble
obliged Servant*

N. GREW.

THE

THE PREFACE.

AS to the following Catalogue, I have some things to say, of the Order, Names, Descriptions, Figures, and Uses of Particulars, and the Quotations I have made therein.

As to the first, I like not the reason which Aldrovandus gives for his beginning the History of Quadrupeds with the Horse; *Quod præcipuam nobis utilitatem præbeat*. Being better placed according to the degrees of their Approximation, to Humane Shape, and one to another: and so other Things, according to their Nature. Much less should I choose, with Gesner, to go by the Alphabet. The very Scale of the Creatures, is a matter of high speculation.

As to the Names, where they were wanting, (which in our own Language were many) I have taken leave to give them. But have generally retained them, where I have found them all-ready given. Although, from some distinguishing Note less convenient; as the Colour is, than the Figure. And sometimes very Improper, as *Concha Persica*, and the like, from the Place. For it often falls out, that the same Thing breeds in many Places. But there is no Natural Reason, why it should be called by one, rather than another. So that the Names of Things should be always taken from something more observably declarative of their Form, or Nature. The doing of which, would much facilitate and Improve the Knowledge of them many ways. For so, every Name were a short Definition. Where as if Words are confus'd, little else can be distinctly learn'd. Yet I took it not to be my part, actually to reform this matter; unless I had been writing an Universal History of Nature.

In the Descriptions, I have taken care; First, to rectifie the mistakes of such as are given us by other Hands. Secondly, not to Transcribe any; as is too commonly done: but having noted something more especial therein, to refer to the Author. Thirdly, where there is no Description at all, or that is too short, or the faults therein many, to give one at large. For the doing of all which, what the trouble of comparing Books together hath been, I say with Sleydan in another Case, *Post Deum Immortalem Ipse novi*.

In the Descriptions given, I have observed, with the Figures of Things, also their Colours; so far as I could, unless I had view'd them Living, and Fresh. And have added their just Measures. Much neglected by Writers of Natural History.

If any object against their length: perhaps they have not so well considered the necessity hereof, for the cleer and evident distinction of the several Kinds and Species, in so great a variety of Things known in the World. And wherein also regard is to be had, to all that after Ages may discover, or have occasion to enquire after. The Curiosity and Diligence of Pliny, is highly to be commended. Yet he is so brief, that his Works are rather a Nomenclature, than a History: which perhaps might be more intelligible to the Age he lived

in,

The Preface.

in, than the succeeding ones. But had He, and Others, been more particular in the Matters they treat of: their Commentators had engaged their own and their Readers Time much better, than in so many fruitless and endless Disquisitions and Contests. It were certainly a Thing both in it self Desirable, and of much Consequence; To have such an Inventory of Nature, wherein, as on the one hand, nothing should be Wanting; so nothing Repeated or Confounded, on the other. For which, there is no way without a cleer and full Description of Things.

Besides, that in such Descriptions, many Particulars relating to the Nature and Use of Things, will occur to the Authors mind, which otherwise he would never have thought of. And may give occasion to his Readers, for the consideration of many more. And therefore it were also very proper, That not only Things strange and rare, but the most known and common amongst us, were thus describ'd. Not meerly, for that what is common in one Countrey, is rare in another: but because, likewise, it would yield a great abundance of matter for any Man's Reason to work upon. He that notes, That a Grey hound hath pricked Ears, but that those of a Hound hang down; may also the Reason of both: for that the former hunts with his Ears; the latter, only with his Nose: So that as a blind Man, minds nothing but what he Hears: so a Hound, having his Ears half Stop'd with the Flaps, minds nothing but what he Smells. He that shall observe, That a Horse, which ought to have many and strong Teeth, and large and thick Hoofes, hath no Horns: and that an Ox, with Horns, hath fewer Teeth; and weaker Hoofs: cannot but at the same time see the Providence of Nature, In disposing of the same Excrementitious parts of the Blood, either way, as is most suitable to the Animal. One that considers the Teeth of a Horse, sees the reason, why he hath so long an upper Lip; which is his Hand, and in some sort answers to the Proboscis of an Elephant; whereby he nimbly winds the Grass in great quantities at once into his Mouth. So that for Nature to have made him a short Lip, had been to make a little Hopper, to a great Mill. The same Animal having need of great Lungs, how necessary is it also for him to have a broad Breast, well bowed Ribs, and wide Nostrils to give them play? That being much pester'd with Flys, he should have a long brush Tail to whisk them off. Whereas the Ass, which either for the hardness and dryness of his Skin, or other Cause, is less annoy'd with them, hath no need of such an one. That being heavy, he should not Tread or Leap stiff, as a Man; but have a Pastern made him, gradually and safely to break the force of his weight. By This, his Body hangs on the Hoof, as a Coach doth by the Leathers. Without this, the most thorow pac'd Horse, would tread so hard, that as it were impossible for any man to endure long upon his Back: so his Joynts would be much chafed, and he must needs presently tyre. Yet if it be too long, by yielding over much, it makes every Step somewhat more laborious, and to loose some ground. He that would have one for Carriage, will choose him short, and high Back'd. For Runing, long, and clean or slender Limb'd: another, were like a Man that should run a Race in his Boots. And a due length is as necessary: which is, when the Measure between the Main and the Tail answers to the hight, or thereabout. If much under, his hinder Feet will want their full scope: if much over, there will be more weight to be moved with the same force, as if the weight were less. But he that would have one for Draught, looks not that the Limbs be slender, if they are strong; especially those behind. For though the fore Legs
pull

The Preface.

pull sometimes, most when they make an acute angle with the Belly; yet the greatest stress usually lies upon the hinder; these being as the Centre of Gravity, and the Load, and Body of the Horse, the two Counter Weights. And when he Goes without Drawing, his fore Feet only support him; but his hinder, serve also as Leavers to carry him on. And therefore when he walks, he always moves his hinder Foot first.

Together with such Notes as these, arising from the Description of the outward Parts; how largely and usefully might that of the Inner; his Generation, Breeding and the like, be also insisted on. And so the like of other Animals. Whereby a better History of them might be written in five years, than hath hitherto been done in two Thousand.

As for the Figures, I have given only those of such particulars, as are omitted by others. Saving one or two, found in some Authors less known, or common. Nor any, but what is also describ'd: which makes any further Explication of these needless, besides what the Reader will find next before them.

After the Descriptions; instead of meddling with Mystick, Mythologick, or Hieroglyphick matters; or relating Stories of Men who were great Riders, or Women that were bold and feared not Horses; as some others have done: I thought it much more proper, To remarque some of the Uses and Reasons of Things. Where also for the sake of the English Reader, I have undergone the transcribing some particulars. More I could have done, with less trouble. These I hope will compensate the room, they take up. Amongst Medicines, I have thought fit to mention the Virtues of divers Exoticks. Because the greatest Rarity, if once experienced to be of good use, will soon become common. The Jesuites Barque, of which, no Man yet hath well describ'd the Tree, and very few know precisely where it grows; yet what great quantity, doth the much use of it bring over to us? Unicorns Horns, upon the like motive of Trade, would be as plentiful as Elephants Teeth.

I have made the Quotations, not to prove things well known, to be true; as one * (and he too deservedly esteemed for his great Diligence and Curio- * Aldrovandus. sity) who very formally quotes Aristotle, to prove a Sheep to be amongst the Bisulca: Ovem, (inquit) ex genere esse Bisulcorum, non solum *auto ipse* ipsa loquitur, sed Aristoteles etiam scripto publicavit, inquiens; as if Aristotle, must be brought to prove a Man hath ten Toes. But partly, To be my Warrant, in matters less credible. Partly, to give the Authors, that which is their due: not at all liking the Malignant-way of some, who never mention any, but to confute him. Yet withall, To rectifie his Mistakes where I found them. And to mind the Reader, Not to peruse the most Honest, or Learned Author, without some caution.

A Prospect of the whole WORK.

Of the MUSÆUM.

PART. I.

Of Animals.

Sect. 1.

Of Humane Rarities.

Sect. 2.

Of Quadrupeds.

Chap. 1. Of Viviparous; and particularly of Multifidous Quadrupeds.

Chap. 2. Of Bifidous, and Solidipedous Quadrupeds.

Appendix. Of certain Balls found in the Stomachs of divers Quadrupeds.

Chap. 3. Of Oviparous Quadrupeds.

Sect. 3.

Of Serpents.

Sect. 4.

Of Birds.

Chap. 1. Of Land-Fowles.

Chap. 2. Of Water-Fowles; particularly of the Cloven Footed.

Chap. 3. Of Palmipeds or Web-Footed.

Chap. 4. Of their Eggs and Nests.

Sect. 5.

Of Fishes.

Chap. 1. Of Viviparous Fishes.

Chap. 2. Of Oviparous Fishes; particularly such as are Not-Scal'd.

Chap. 3. Of Scaled Fishes.

Chap. 4. Of Exanguious Fishes.

Sect. 6.

Of Shells.

Chap. 1. Of Shells Whirled and single.

Chap. 2. Of Shells Double and Multiple. To which are subjoyned 7. Schemes comprehending them all.

Sect. 7.

Of Insects.

Chap. 1. Of Insects with Naked Wings.

Chap. 2. Of Insects with Sheathed Wings.

Chap. 3. Of Creeping Insects.

PART. II.

Of Plants.

Sect. 1.

Of Trees.

Chap. 1. Of Woods, Branches and Leaves.

Chap. 2. Of Fruits; particularly such as are of the Apple, Pear, and Plum Kinds.

Chap. 3. Of Calibashes; and some other like Fruits.

Chap. 4. Of Nuts, and divers other like Fruits.

Chap. 5. Of Berries, Cones, Lobes, and some other Parts of Trees.

Sect. 2.

Of Shrubs and Arborecent Plants.

Chap. 1. Of Shrubs, chiefly.

Chap. 2. Of Arborecent Plants.

Sect. 3.

Of Herbs.

Chap. 1. Of Stalks and Roots.

Chap. 2. Of Fruits.

Chap. 3. Of Seeds.

Sect. 4.

Sect. 4.

Of Mosses, Mushrooms, &c. Together with some Appendents to Plants.

Sect. 5.

Of Sea Plants.

Chap. 1. Of Sea Shrubs.

Chap. 2. Of other Sea Plants; and of Sponges.

PART. III.

Of Minerals.

Sect. 1.

Of Stones.

Chap. 1. Of Animal Bodies petrified; and such like.

Chap. 2. Of Vegetable Bodies petrified; and Stones like them.

Chap. 3. Of Corals, and other like Marine Productions.

Chap. 4. Of Gems.

Chap. 5. Of other Stones Regular.

Chap. 6. Of Stones Irregular.

Sect. 2.

Of Metalls.

Chap. 1. Of Gold, Silver, and Copper.

Chap. 2. Of Tin, Lead, and Iron.

Chap. 3. Of Antimony, Mercury, and other Metallick Bodies.

Sect. 3.

Of Mineral Principles.

Chap. 1. Of Salts.

Chap. 2. Of Ambar and other Sulphurs.

Chap. 3. Of Earths.

PART. IV.

Of Artificial Matters.

Sect. 1.

Of things relating to Chymistry, and to other Parts of Natural Philosophy.

Sect. 2.

Of things relating to Mathematicks; and some Mechanicks.

Sect. 3.

Chiefly, of Mechanicks.

Sect. 4.

Of Coins, and other matters relating to Antiquity.

Appendix.

Of some Plants, and other Particulars.

Index.

Of some Medicines.

List.

Of those who have contributed to this Musæum.

Of the Anatomical Part.

Chap. 1. Of the Stomachs and Guts of six Carnivorous Quadrupeds, sc. a Weesle, Fitchet, Polecat, Cat, Dog, and Fox.

Chap. 2. Of the Mole, which seems to feed on Insects, as also of the Urchan, Squirrel, and Rat; chiefly frugivorous.

Chap. 3. Of a Rabbit, Horse, and Pig; both frugivorous and graminivorous.

Chap. 4. Of a Sheep, and Calf; chiefly graminivorous.

Chap. 5. Of the Uses of the Gullets of Quadrupeds.

Chap. 6. Of the Uses of the Stomachs of Quadrupeds.

Chap. 7. Of the Uses of the Guts of Quadrupeds.

Chap. 8. Of the Stomachs and Guts of Birds.

Chap. 9. Of their Uses.

Chap. 10. Of the Stomachs and Guts of Fishes.

With a Short Explication of some of the Figures, next before them.

At a Meeting of the Council of the Royal Society,
July 18th 1678.

Ordered,

THat Dr. Grew be desired, at his leasure, to
Make a Catalogue and Description of the
Rarities belonging to this Society.

Thom. Henshaw Vice-Præses R. S.

At a Meeting of the Council of the Royal Society,
July 5th 1679.

Ordered,

THat a Book entitled, *Musæum Regalis Societa-*
tis, &c. By Dr. Nehemiah Grew, be Printed.

Thom. Henshaw Vice-Præses R. S.

The Reader is desired to amend the following

ERRATA.

PAge, 5. line, 3 ; *for*, only ; *read*, chiefly. p. 7. l. 24. *r.* Biliaria. p. 16. l. 12.
r. Conical. p. 41. l. 20. *r.* Humorous. p. 49. in the margin, *r.* Schroderi Phar-
mac. p. 65. l. 15. *f.* European, *r.* Common. l. 22. again, *r.* Common. p. 70. l. 1.
f. Poop, *r.* Prore. p. 72. l. 16. *f.* Mona, *r.* Man, and. p. 73. l. 1. *f.* Mona, *r.* Man.
p. 103. *r.* Oviparous. p. 126. l. 34. *dele*, other. p. 136. l. 12. *r.* Fore-Whirled.
p. 182. l. 18. *add*, Or rather, *Prunus Sylv. Americana* ; the AMER: BLACK
THORN. p. 202. l. 14. *r.* Ciliare. p. 220. l. 26. *r.* Taxocoquamoclit. p. 252.
l. 10. *dele*, a Cap.

A
DESCRIPTION

OF THE
RARITIES
Belonging to the
ROYAL SOCIETY,

And preserved at
Gresham Colledge.

PART I.
OF ANIMALS.

SECT. I.
Of Humane Rarities.

AN ÆGYPTIAN MUMMY given by the
Illustrious Prince *Henry Duke of Norfolk*. It is
an entire one taken out of the Royal Pyramids.
In length five feet and $\frac{1}{2}$, defended with several linnen Co-
vers, all woven like ordinary Flaxen Cloth. But by the
spinning, distinguished into three kinds. The utmost, is
like Flaxen Cloth of two shillings an Ell: the inmost, of
half a Crown: the middlemost, of three shillings, or there-
about.

The utmost Cover is divided into several pieces, each of
doubled Linnen, and adapted in figure to the part it covers,

B

as

as one on the Breast, another on the Belly, and so on all the principal Parts. On each of these pieces is laid a white Paint, of a kind of chalky or limy substance, of the thickness of a Hen-Egg-shell. Upon this chalky ground are drawn the Hieroglyphick Figures of Men, Women and Birds; in Gold, yellow, red and blew. But with very rude shapes, and the Colours no where mixed together. So very mean was the Art of Painting amongst the *Ægyptians* heretofore. For we have reason to believe, that what was done for one of their Kings or Nobles, was done with their best skill.

The middlemost Cover consisteth of one single and entire piece of Linnen, almost like a Winding-sheet. It is also tinged with some kind of Paint, but very lightly, and without any Figures.

The inmost Covering is wrapped round about the Head, Trunk, each Arm, and each Leg apart, about thirty or forty times, like so many swathing Bands. About twenty of the utmost of these folds are lightly tinged, all the other inmost more fully, with a blackish and gummous substance. But the Flesh so fully, as it seems to be converted into a black Rosin; which being held to the flame of a Candle, is a little odorous and inflammable. The Bones also, are not only outwardly, but also quite through of a black colour, as if they were burnt.

From hence it is very probable, That the way of Embalming amongst the *Ægyptians*, was by boiling the Body (in a long Cauldron like a Fish-kettle) in some kind of liquid Balsome; so long, till the aqueous parts of the flesh being evaporated, the oily and gummous parts of the Balsome did by degrees soak into it, and intimately incorporate therewith. Much after the same manner, as the Sugar doth, in the conditing of Pears, Quinces, and the like.

'Tis also likely, that a better way might be taken, than this used by the *Ægyptians*. And that is, by boiling, or rather soaking the Body in some white sort of Oyl, and such as will dry, (as that of Walnuts) made and kept so hot, as to evaporate the watery parts by degrees, and to keep the flesh white, and not brittle, but limber and plient. Which, especially in the business of Anatomy, would be of good use: because, that all the Muscles of the Body, being

being first parted one from another, might hereby be preserved sound, clean, and limber upon the Bones; and so all the motions of the parts be explicated with the greatest ease, and without any offensiveness.

'Tis equally probable, that the whole Compages of the Muscles, as they lie upon the Bones, might with little trouble, and less charge than by the former way, be truly Tanned, or reduced to a limber sort of Leather; whereby also the wastage of the fibers, or other mechanisme of the Muscles might more easily and leisurely be observed. For the skins of Beasts, whereof Leather is daily made, are Muscular; and in mans body consisteth, for the most part, of the same carneous fibers, as the Muscles, but more closely woven or matted together.

Mummy, saith Wormius (a) (and so most Writers here- of) is of great use against Contusions, clodded Blood, Hard Labour, &c. But let them see to it, that dare trust to old Gums, which have long since lost their virtue.

(a) Musæum
Wormia-
num.

By some Chymists are also prepared *Mummie Tinctura Quercetani*; *Mummie Extractum Crolli*; *Oleum Olivarium Mummium*. (b) But the prudent Reader will take heed of words.

(b) Schrod.
Pharm.

A MALE HUMANE FOETUS. Given by Thomas Cox Esq; An Abortive of about the 4th Month. In length five inches. The Head, from the hinder part to the face, an Inch and $\frac{1}{2}$. The Face, an Inch and $\frac{1}{4}$. The Back, from shoulder to shoulder, an Inch and $\frac{3}{4}$ broad. The Buttocks an Inch. The Arms and Thighs $\frac{1}{2}$ Inch over. The Wrist and small of the Leg, $\frac{1}{4}$ of an Inch. The Navel-string $\frac{1}{2}$ of an Inch; twisted like a Rope; and cut off five Inches long. The Eyes shut. But the Mouth open. It hath neither Nails, nor Hair. The Skin white and smooth, almost as in Children newly born. See Dr. W. Needham's curious Book *de Fætu Formato*. (c)

(c) And Ho-
bokenus's
*Anatomia
Secundine
Humanæ.*

The largeness of the Head and Chest, with respect to the other parts, is observable. The mouth being open, shews that the *Fætus*, even in the 4th Month, may that way take part of its Aliment. (d) The Skin hath been kept white and smooth for so long a time, *scil.* above fifteen years, by being included with rectified spirit of Wine in a Cylindrical Glass; to the middle of which the *Fætus* is poised, by means of a

(d) See Har-
vey de Ge-
nerat. Ani-
malium.

Glass Buble of an Inch diametre, the Neck whereof is fastned to the *Anus* of the *Fætus* by a wyer.

The entire *SKIN* of a *MOOR*. 'Tis tanned with the Hair of the Head, and even the smallest in all the other parts remaining on it.

Herein are observable, the Fibers in the skin of the *Penis*, which are very white, and exquisitely small, like the thread of a Spiders Web. Likewise the thinness of the true *Cutis* in the sole of the Foot; and on the contrary, the extraordinary thickness of the *Cuticula*, especially in the Heel, exceeding the sixth part of an Inch: which is about fifty times the thickness of that in the ball of the Hand.

(a) Historiar.
Cent. 5.

Bartholine (a) mentions a *Farrier* who had several *Callosities* on his Right-Hand Fingers, as big as Walnuts.

(b) Historiar.
Cent. 3.

The same Author (b) shews the way of tanning a Humane Skin. I believe it may be tann'd by all the ways which are us'd upon other Skins.

(c) Ibid.

He saith, (c) *That a Thong hereof ty'd about the middle, is of good use for facilitating the Birth; and especially against Mother-Fits.* Whether any other way, if so, than by raising and fortifying the phancy (which will sometimes produce strange effects) I leave to the Reader to judge.

All the Principal *VEINS*, *ARTERIES*, and *NERVES*, both of the *Limbs* and *Viscera*. The generous Gift of *John Evelyn* Esquire. He bought them at *Padoa*, where he saw them with great industry and exactness (according to the best method then used) taken out of the body of a Man, and very curiously spread upon four large *TABLES*, whereon they are now preserved. The Work of *Fabritius Bartoletus* then *Vestigijs*'s Assistant there, and afterwards Physician to the King of *Poland*.

The *Veins* and *Arteries* are so exceedingly well done, as to shew the most curious Schemes which *Laurentius* and other Physicians have given us of them, are real and not fictitious. But the *Nerves* have been much more truly and fully represented to us of late by Dr. *Richard Lower*, in Dr. *Willis*. (d) Especially as to their *Plexus* and *Inosculation*s, and their admirable *Distributions* to the *Organs* of the *Senses*, and the *Viscera*.

(d) De Nervorum Descript. & usu.

(e) Histor. Anim. lib. 3. c. 3.

Aristotle (e) by the account he gives of the Doctrine of the Naturalists of his Time, and before him, seems to have

have been the first, who to any purpose, observed the Distribution of the *Sanguineous Vessels*. Yet he describes them chiefly ~~only~~ from the Heart upward. Nor makes he any distinction betwixt the *Vena Portæ*, and the *Vena Cava*. So that even here he comes far short of that exactness which Anatomists have since arrived at; as appears, upon inspection, by the TABLES above mention'd.

The S C E L E T O N of a Man. Wherein the number of Bones (about two hundred and fifty) together with their dimensions, figures, and articulations are all easily observable. Given by *Thomas Povey Esquire*.

The History of the Bones, as finished, is well perform'd by most Anatomists. But the manner, and order of their beginning and perfection, hath been given us, so far as I know, by the diligent Observations of *Kirckringius* (a)

(a) Kirckringii Osteologia.

only. Of all Humane Bones indifferently, as well as of the Skull, are prepared, *Spiritus simplicior*, *Spiritus oleosus*, *Oleum rectificatum*, & *Magisterium*. Amongst which, the *spiritus oleosus*, if well prepared, is of undoubted use against *Hysterical Passions*; and in some other Cases, where the *Nerves* especially are affected.

The S C E L E T O N of a Woman; of equal height with the former. By comparing these two together, it may be noted, That the *Os Ilium* is larger and more outward in the Female Skeleton, than in the Male; *sc.* for the more easie Labour, as *Bartholine* and others have also observed by the like comparifon. I add; That the same Bone is also broader by $\frac{1}{2}$ an Inch in the Female Skeleton, than in the Male: *sc.* for the better sustentation of the *Fætus* in the Womb. Again, That the *Os Sacrum* is half an Inch longer in the Female: both for the forementioned reason, and also the better proportion of the Parts. On the contrary, That the *Vertebræ*, especially of the *Loyns*, are much broader, thicker, and stronger in the Male Skeleton, than in the Female; being hereby better fitted for the bearing of burthens. And, that as in the Male Skeleton there are 32 Teeth, as is usual, and in the Female but 28; So the nether Chap in the Male Skeleton is half an Inch broader than in the Female, as being made to accomodate a bigger Muscule for the motion of those Teeth.

Teeth. And for the same reason, the Angles subjected to the *Os Jugale* are above $\frac{1}{2}$ an Inch more distant; For that a Man being fitted, in other respects, to undergo more labour; his Chaps also should be the better made to eat the more. Once more, That the Skull of the Male Sceleton, is much bigger, than of the Female; and so capable of more Brains. Although a little House may be well furnished, and look better than a great one that stands empty.

The S C E L E T O N of an Abortive Humane *Fœtus*. 'Tis not above two Inches long. The parts of the Head, Chest, and Limbs are all entire, but not perfect. For the extremities of the Bones of the Arms and Leggs, are at both ends plainly cartilagineous. They are in thickness like a Taylors stitching Thread. Given by *Thomas Povey Esq;*. See *Kirckringius de Fœtûs Ossibus*.

(a) See the Authors Anatomy of Plants.

(b) See the Authors Comparative Anatomy of Trunks.

(c) See Schrod. Pharm. and others.

It may possibly be conceived by some, That the Bones, at least some of them, are hard at the first; as Salts and other like CrySTALLIZING Bodies are as hard upon the very first instant of their shooting, as they are when grown into great Crystals. But it is so far evident, that all the Bones are soft at the first, that I am of opinion, That originally they are a Congeries of *Fibers* or fibrous Vessels, as true as any other in the Body; which by degrees harden into Bones: even as the inmost Vessels in a Plant, do in time harden into Wood. (a) And that as in a Plant, there are successive additions of Rings or Tubes of Wood, made out of Vessels: So in an Animal, it seems plain, That there are additions successively made to the Bones out of the Fibrous parts of the Muscles; especially, those whitest Fibers which run transversely, and make the stamen or warp of every Muscle. So that as in the *Barque* of a Plant, part of the Vessels are successively derived outward to the *Rind*, and part inward to the *Sap*, which afterwards becomes *hard wood*. (b) So in the *Flesh* of an Animal, part of the *white transverse Fibers* are successively derived to the *Skin* (of which this chiefly consists) and part of them inwardly, making still new *Periosteum's* one after another, as the old ones become so many additions to the *Bones*.

A H U M A N E S K U L L that was never buried. Whereof there are several Medicines prepar'd, (c) as *Cranium*

nium Humanum præparatum, Cranium Humanum Calcinatum. Cranii Humani Magisterium, Spiritus Essentificatus, Oleum, Sal Volatile, Tinctura, Galreda, i. e. Extractum Cranii Theophrasti. But the *Cranium præparatum*, and the *spirit* are most, and most deservedly, in use.

A HUMANE SKULL cover'd all over with Moss, by the *Paracelsians* call'd *Usnea*. This Moss is by them commended for its peculiar Virtue in stopping of bleeding at the Nose.

Upon comparifon it appears to me, to be the same, *in specie*, with that described by *Johannes Bauhinus* under the Title of *Musculus facie Abietis*. So that we may probably expect the same advantage from the use of this, as of that which grows upon Skulls. For a Skull can have no further influence, than hath the alteration of the soil: which although it may produce some differences, yet is seldom or never known to alter the specifick Virtue of a Plant.

A HUMANE SKULL cover'd all over with the Skin. Having been buried, as is probable, in some Limy, or other like soil, by which it was tann'd or turn'd into a kind of Leather.

The GALL BLADDER, together with the VASA BILIARIA, taken out of the Liver, and filled with soft red Wax. Performed, and given by Dr. *Swammerdam*.

The SPLEEN most curiously EXCARNATED, and the Vessels filled with wax: whereby its Fibers and Vessels are very well seen. Performed, and given by the same Hand.

A Portion of the PENIS and Urethra: wherein the *Corpora Nervosa* are most conspicuous. By the same Hand.

A Portion of the INTESTINUM JEJUNUM: wherein the *Valvulae conniventes* observed by *Rhuysserius*, delineated by *Kirckringius*, are well seen.

It is observed (a) by Dr. *William Cole*, That not only these Valves, but the Fibers of the inner Muscular Membrane of the Guts are admirably continu'd in a spiral Line, all along from the *Stomach* to the very *Anus*.

The PROPER VESSELS of a HUMANE TESTICLE,

(a) Philosoph. Transf. N. 125.

TESTICLE, separated and expanded, from their most close and numerous into wider folds, for the space of a foot in length, and half a foot in breadth. Performed by Dr. Edmund King.

It is taken for granted, I think almost by every body, That *Van Horne* and *de Graaf* were the first Observers of these Vessels. But that every one may have his due, it is worth the Readers notice, That ten years before *de Graaf's* Book concerning the same, a Description with Figures thereof, in the *Testicles* both of a *Boar* and of a *Man*, were first published by *Vauclius Dathirius Bonglarus*, sc. in the Year 1658. Whereof also Mr. *Oldenburgh* hath given an account in the *Philosophical Transactions*. N. 42.

The W O M B of a W O M A N, blown up and dried. Together with the *Spermatick Vessels* annexed; and the *Arteries* in the bottom of the *Uterus*, undulated like the *Claspers* of a *Vine*; all filled up with soft Wax. Also the *Membranous* and *Round Ligaments* of the *Womb*, the *Ureters*, *Bladder*, *Clitoris*, *Nymphæ*, *Hymen*, *Fallopian Tube*, and the *Ovarys*, commonly called the *Testicles*; all made most curiously visibly, and given by Dr. *Swammerdam*. The Descriptions and Figures hereof may be seen in the same Authors Book, printed at *Leyden*, 1672. and presented to the *Royal Society*.

Of the Organs appropriated to Generation in both Sexes, see also *Van Hornes Prodomus*, and *Regnerus de Graaf*.

Of the manner and use of filling the Vessels with Wax, or other like substance, see the Honourable Mr. *Boyle*, in his First Part, *Of the Usefulness of Natural Philosophy*; who, I think, was the first that made mention of managing and representing them this way.

A T O O T H taken out of the *Testicle* or *Ovary* of a Woman, and given by Dr. *Edward Tyson*. 'Tis near $\frac{1}{2}$ an Inch long, pointed like the *Eye-Tooth* of a *Man*, but more slender. As hard and white as any in the Head.

Here is also the Draught of another T O O T H, taken also out of the *Ovary* of a Woman, by the same Hand, being shaped pretty like one of the *Grinders* or great Teeth, and as big. It is as white and as hard as the former. The *Womans Husband* keeps the *Tooth* it self by him.

Hair

HAIR taken out of the *Ovary* of a Woman, and given by the same Hand. It is fine, and most of it grey. The length of one Hair (longer than the rest) $\frac{3}{4}$ of a yard.

HAIR found by the same Person in the *Ovary*, and Hornes of the Womb of a Bitch: as also in the *Omentum*, Veins, and Heart. 'Tis all short, answerable in length to the Hair of a Dog; and of a brown colour.

The BONES of a Humane LEG and FOOT grown together, and in some places rarified like a Sponge or Pumice-Stone. 'Tis very probable, it was a Disease in the Bones somewhat like to that which Chirurgions call an *Exostosis*; and that they became such, by some malignant and strumous Ulcer.

A piece of a BONE voided by Sir *W. Throgmorton* with his Urine. Given by *Thomas Cox Esq.* 'Tis about the 3^d. of an Inch over, and almost square. Smooth on one side, and spongy on the other, on the edges rugged. About the bigness of a little green Peas.

In the Philosophical Transactions (*Num. 41.*) there is a Relation of a BULLET that was voided by the *Penis* with the Urine. Communicated by *Dr. Nath. Fairfax.*

A STONE voided from the *Penis* or *Urethra* of a Man who lived at *Exeter*. Given by *Dr. Cotton.* It is of a whitish colour, and soft substance, almost like Chalk. In length two Inches and a quarter. Of a Pyramidal figure; with an obtuse Cone. Near the Base an Inch over. Where it hath a little Hole or Canale tending towards the Cone. When it first slipped out of the Bladder into the *Penis*, it was neither so thick or big, nor so hard, but that, as it seems, the Urine pressing forward, forced a hole for its passage through the middle of it. Which being opened, the Stone continued fixed in the same place, viz. about an Inch behind the *Glans Penis*, for the space of Thirteen Years. In which time, it gradually grew bigger, till it came to the bulk above mention'd. And the said Hole or Canale being by the continual accretion of new matter, at last stop'd up, the Stone was then forced out of the end of the *Penis*.

This Man, in all this time, scarce felt any great Pains; neither did he omit his usual Recreations or his business. And once he took a Journey (*on Horseback*) from *Exeter*

C

to

to *London*, is about an hundred and thirty eight miles, without any trouble.

(a) Histor.
Cent. 5.

Bartholine (a) mentions a Stone as big as a Walnut, of an Ounce weight, which was voided at the upper end of the *Urethra*, through which it there forced its way.

Of Humane Stones bred either in the Kidneys or Bladder, are prepared, The *Crystalline Salt*, and the *Elyxir*. Medicines hardly to be got, and at last, to little purpose.

Of the Nature of the Stone, and of those Medicines which are most effectual to prevent the Generation of it, see some experiments of the Authors in his Book of the Luctation arising from the mixture of Bodies.

SECT. II.

Of Quadrupede's.

CHAP. I.

Of Viviparous Quadruped's; particularly, such as are *Multifidous*.

(b) Barl. Re-
rum gest. in
Braf. Hist.
p. 223.
(c) Joh. de
Laet.
(d) Aldro-
vandus a
Monfct de
Re Cibariâ.

A MONKEY. *Cercopithecus*: qu. *Simia caudata*. See the Descriptions and Figures of several kinds in *Aldrovandus*, *Marggravius*, and others. *Aldrovandus* speaks of some as big as a Mastiff, having Tails five Cubits long. In *Brasile* there is a sort of yellowish Monkey, which smell like Musk. (b) In which place they are numerous, and in great variety. (c) As also in all the Mountanious places of the *East Indies*. (d) As they climb the Trees, if in danger of falling, they save themselves not only with their Feet, but their Tails, by wrapping them round about the next Bough. The *Zygantes* in *Africa* esteem them good meat.

The SKELETON of a MONKEY. Where- in the distance betwixt the *Os sacrum* and the *Ischia*, as it is much greater, than in the Skeleton of a Woman, is observable. Likely so, in other Viviparous Quadrupede's: for

for which cause, partly, they have all more easie Labour than a Woman.

The THROTTLE BONE of a Male AQUICUI; which the People of *Brasile* call the *King-Monkey*; being far bigger than all the other kinds; described by *J. de Laet*, (a) out of *Lerius*. 'Tis a Bone, so called by the *English*, with the help of which he makes a very great noise. For 'tis hollow, and very hard. Exceeding thin, and so half transparent. In length two Inches and $\frac{1}{2}$. In height an Inch and $\frac{3}{4}$. In breadth almost two Inches. At one end, hath an Aperture an Inch wide every way. On the top furrow'd, so as to resemble a Puppies Skull.

I suppose it is placed in the Throat, or at the upper end of the *Larynx*, near the *Epiglottis*. *Joh. Lerius* describing of it, (b) falsly calls it a Membrane.

The SLOATH. *Ignavus sive Pigritia*. An Animal of so slow a motion, that he will be three or four days, at least, in climbing up and coming down a Tree. (c) And to go the length of fifty Paces on plain ground, requires a whole day. (d) The Natives of *Brasile* call him *Haii*, from his voice of a like sound: which he commonly repeats about six times together, descending, as if one should sing, *La, sol, fa, mi, re, ut*. (e) Whatsoever he takes hold of, he doth it so strongly (or rather stiffly) as sometimes to sleep securely while he hangs at it. (f) See his Description in *Clusius*, *Marggravius*, *Piso*, and others. They all seem to omit the length of his fore feet, which is almost double to that of his hinder.

From the shag of his Body, the shape of his Legs, his having little or no Tail, the slowness of his gate, and his climbing up of Trees, as little *Bears* are us'd to do, he seems to come near the Bear-kind: from which he chiefly differs, In having but three Claws upon a foot. He breedeth principally in *Florida* and *Brasile*.

Two BLACK-BEAR CUBS. The Description of the Bear, see in *Aldrovandus*, *Gesner*, &c. The Anatomy, in the *Philosophical Transactions*, N. 49. They breed most in *Nova Zembla*, and other of the more Northerly Countries. In *Norway* they hunt him, and so in *Helvetia* and *Muscovy*, and if he be fat, they account him a delicate Dish. (g)

(a) Lib. 15.
c. 5.

(b) J. de
Laet. lib. 15.
c. 5.

(c) Bartæus
de Reb. Bras.
p. 222.
(d) Clusius.

(e) Id.

(f) Guliel.
Piso.

(g) Moufët,
de Re Ciba-
ria, & Mu-
sæum Worm.

'Tis observed by *Aldrovandus*, That a *Bear* hath Hair on both the Eye-lids, as a *Man*, which other *Quadrupedes* have not. *Natalis Comes* (cited by the same Author) comparing his parts with those of a *Man*, reckons his *Claws* among them, which are much more like to those of a *Lion*. So easie it is, to drive on the comparison too far, to make it good.

The FOOT of a white *Groenland* B E A R, which is half a foot broad. *Vadianus* (a) saw a Bear-skin five feet long, and broader than a Bulls Hide. The Bear to which this Foot did belong, might be as big:

(a) Quoted
by Gesner.

A L E O P A R D S S K I N. 'Tis a yard broad. From the Snout to the hinder end of the Tail near three yards. The Tail a yard. See the Description of the Animal in *Aldrovandus*, &c.

If they are well compar'd, he is every way, in shape, like a *Cat*: his Head, Teeth, Tongue, Feet, Claws, Tail, all like a *Cats*. His actions also like a *Cats*; he boxes with his fore-feet, as a *Cat* doth her *Kitlins*; Leaps at the Prey, as a *Cat* at a *Mouse*; and will also spit much after the same manner. So that they seem to differ, just as a *Kite* doth from an *Eagle*.

The *Leopard* (and all of this kind) as he goes, always keeps the *Claws* of his fore-feet turned up from the ground, and sheath'd as it were in the Skin of his Toes, whereby he preserves them sharp for Rapine, extending them only, when he leaps at the Prey. See somewhat to this purpose in *Gesner*, out of *Pliny*.

(b) Aldro-
vandus.

He is begotten by a *Lion*, upon a *Panther*, (b) which hath her name from her being so fierce. Yet in *Tartary* they keep *Leopards* tame, and breed them up for hunting of *Deer*, and other Beasts; especially for the *Great Cham's* use. (c) They are most numerous in *Africa* and *Syria*.

(c) Gesner
out of Pau-
lus Venetus.

The SKULL of a young T I G E R. Both as to the Teeth, and otherwise it well resembles that of a *Cat*. Except that in the room of the Transvers Suture in a *Cat*, there is one in the figure of a great Y; so wonderfully close and firm, as the Bones seem to be continuous. Except also the outward Sinus's of the lower Jaw, where the *Musculi Temporales* and the *Mansorii primi* are inserted: as being, rateably, much deeper than in a *Cats*; and so better fitted to receive those *Muscles* which are here also much more robust. Two

TWO CLAVICULAR Teeth or Tusks of a Tiger. A little crooked like those of a Dog or Cat. Their exerted part very white. By the bow, almost five Inches long. From the top of their Root, or from the seat of the Gooms, to their *apex* near two Inches. An Inch over, and two and $\frac{1}{2}$ about. The Animal to which they belonged, was kill'd in *Java major*, and weighed 435 pounds. A great weight, considering, that not feeding on Grass, but Flesh only, they have no great Belly. *Aldrovandus* saith, He saw the Skin of one above five foot long, and therefore guesses the Animal was almost as big as a Horse. Which this also may well be thought to have match'd.

One of the fore-CLAWS of the same TIGER. 'Tis somewhat white and half transparant, very flat, sharp pointed, and extreemly hooked; every way in colour and shape like the Claw of a Cat. At the *Basis*, 'tis an Inch broad, and measur'd by the bow, 'tis two Inches and $\frac{1}{2}$ long. Note, That as the Bone, whereon the Claw is set, receives it into a little *Fovea* or Groove; so is the Bone, again, by a double *Epiphysis*, inserted into the Claw: by which means it is more strongly and immovably contained in its place, for the surer grasping of the Prey.

Two other lesser CLAWS of a TIGER.

The Tiger excels in swiftnes; from whence he hath his *Arabick* Name, as well as the River call'd *Tigris*. As also in Fierceness: and yet in fondness and love to her *Cubs*; of which see divers instances in *Gesner*. An Impression which Nature hath stamp't upon all Creatures, to secure the succession of Generation. They abound in *Mexico*, *Brasile*, and in the *East Indies*.

A Great STONE taken out of a Dogs Bladder. Given by the most Reverend *Seth* Lord Bishop of *Sarum*. The figure hereof is Oval, but flat on both sides. 'Tis above an Inch and $\frac{1}{2}$ thick, two Inches and $\frac{1}{2}$ over, and above three Inches long. Of a limy or chalky colour, and all over rough.

Note, that nitrous spirits dropped here upon, scarce produce any ebullition; although dropped on the redish Stones, bred in a mans bladder, it produceth a great one. Of a like Stone bred in a Dogs bladder, see a Relation in the *Phil. Transf.* N. 84. Taken out of the *Roman Journal de Letterati*. The

The GREAT TAMANDUA; by the People of *Brasile*, *Tamandua-guacu*; by the *English*, the *Great Ant-Bear*; Because he feeds upon *Ants*, and is shagg'd, and hinder-footed almost like a *Bear*. He hath also a very long and sharp Snout, a slender Tongue, and extensible to a great length, also a long and brushy Tail: which are his principal Characters. See him described in *John. de Laet*, out of *Lerius*, in *Guliel. Piso*, *Marggravius*, and others. *Abbæ-villanus*, quoted also by *Joh. de Laet*, (a) hath given a different Description; and probably a false one.

(a) Lib. 16.
c. 15.

He catcheth *Ant's* by scratching open their subterranean Hives, and then thrusting his Tongue into them; which after a while, he draws back into his mouth laden with the Prey. (b) He useth his Tail for a Cover, which, like a Squirrel, he sometimes spreads over his whole body. (c)

(b) Barlæi
Res Brasil.
p. 223.
(c) Ibid.

The SKULL of the RIVER-HORSE or HIP-POPOTAMUS. If we respect his Figure, he were more properly called BUPOTAMUS, or RIVER-OXE. And accordingly the *Germans* rightly call him *Wasser-Ocks*; and the *Italians* at *Constantinople* BOMARIN. The same Animal, which in the Book of *Job* is called BEHEMOTH; as is solidly proved by *Bochart*, in his *Hieroicoicon*. He is almost every where described very falsely. *Aristotle* falsely gives him a Mane, like that of a Horse: deluded, 'tis likely, by the Name. *Kircher* (d) falsely gives him all Horse Teeth. In the *Musæum Romanum*, he is described with double Hoofs like an Ox, and pictured with four or five Claws like a Bear; neither truly. *Bellonius*, who saw one alive, but yet very young, was the first that hath given any tollerable Description of him. Yet as to the Teeth, he is mistaken, comparing them all to those of a Horse: probably because they were not yet grown. (e) But *Columna*, who also saw one, and that full grown, hath given a most accurate Description hereof, his principal Characters being these; Four yards and half long, about two yards high, a yard and half broad. Short leg'd. Cloven-hoofed; yet not with two, but four Hoofs. Tailed like a *Tortoise*. (Or like a Hog, (f) which he also twists in the same manner) Head almost like an Ox. His Chaps wide. His Eyes small. His fore Teeth prodigiously great, being some of them $\frac{1}{2}$ a foot round about, above $\frac{3}{4}$ of

(d) Chin.
Illustr.

(e) Fab. Co-
lum. lib. de
Aquat. &
Terrest.

(f) Solinus
and others
quoted by
Bochart.

of a foot long ; as is evident in the Skull here preserved ; and other particulars mention'd by *Columna* in his copious Description hereof.

The great prominency of the *Os Jugule* is also observable ; as being thereby fitted for the reception of marvellous great and strong *Muscles* for the drawing of his Chaps together.

Rings made of his *Teeth*, are believed to be very effectual against the *Cramp*. (a) Those that sell *Artificial* *Teeth*, usually make them of the long *Teeth* of this Animal, as being supposed the best for this purpose. (a) Charl. On. Zoci.

His *Teeth*, says *Columna*, are so hard, that being struck against *Steel*, produce sparks of fire. And thence concludes it probable, That this Animal, by striking his *Teeth* one against another, in the night time, might produce the like, and so seem, as it were, to vomit or breath out fire ; a thing attributed to him by the Ancients. But the error of this Conjecture is double : First in his not considering, That the fire (could any be produced by striking *Steel* against these *Teeth*) would be struck not out of the *Teeth*, but out of the *Steel*. And next, In that, in truth, no fire can be produced by either striking of these *Teeth* one against another, or against *Steel* it self ; as I have try'd.

He is found in the Rivers *Nile* and *Bamboth* ; (b) as also near the *Indian* ; and in *Zaire*, the great River of *Congo*. (c) (b) Fab. Colum. out of Strabo and Solinus.

Several *Teeth*, both of the upper and nether Jaw of the *Hipopotamus*. Some so big, that they seem to have belonged to a much bigger Skull, than this here. (c) Mus. Sep. tal. c. 29. & Linschot. 204.

A *PISLE* said to be that of the *HIPPOPOTAMUS*. It seems to be only that part of the *Pisle* which he exerts. 'Tis in length, above a foot. The *Glans* even now it is dry, above seven Inches about. The other end very slender.

The fore-*TOOTH* of a *BEVIR*, so called from *FIBER*, by a transposition of Letters. 'Tis three Inches and half long, with the Root, or that part which is fixed in the Chap. Near half Inch broad. A little crooked, and distorted or writhen. Triangular, the inner Angle more obtuse. Its end sharpen'd very obliquely, after the manner of a *Chizel*. So that these *Teeth* may properly be called *DENTES SCALPRarii*: wherewith this Animal, as with so many strong *Chizels*, pairs off the *Barques* of Trees for his use. The

The TAIL of a CASTOR or BEVIR. Of a peculiar shape, being very broad and flat, like an *Apothecaries Spatula*, but much bigger, being ten Inches long, and five broad. Almost bald, though the Beast very hairy; and cancellated with some resemblance to the *Scales* of *Fishes*. Nature having hereby, as well as in other respects, marked him for an *Amphibious* Animal. The *Scythians* (a) eat the Tail of a *Castor*, as a dainty, being sometimes as fat as bacon.

(a) Gefner
out of Pom-
ponius Sabi-
nus.

The PISLE-BONE of a CASTOR. So I find it inscrib'd. 'Tis very smooth and solid. In length four Inches and $\frac{1}{2}$. Conical, about $\frac{1}{2}$ Inch over at one end, $\frac{1}{4}$ Inch at the other. At both ends inflected like the letter S.

See the Description of the Animal in *Gesner*, and others. His parts most remarkable, are those now described, and the *Castor-Bag*. His Anatomy see in the *Philosophical Transactions*, N. 49. Many strange Stories of his Ingenuity in *Aldrovandus*, *Wormius*, and others. He breeds in *Italy*, *France*, and other places: but our best *Castor* is from those of *Russia*. The great and principal use whereof inwardly, is in *Hysterical* and *Comatose Cases*.

An OTTER. *Lutra*. See him describ'd in *Aldrovandus*, &c. The Toes of his hinder feet, for the better swimming, are joyn'd together with a Membrane, as in the *Bevir*. From which he differs principally in his Teeth, which are *canine*; and in his Tail, which is *feline*, or a long Taper. So that he may not be unfitly called *Putorius aquaticus*, or the *Water Polecat*. He makes himself burrows on the water side, as a *Bevir*. Is sometimes tamed, (b) and taught, by nimbly furrounding the Fishes, to drive them into the Net. In *Scandinavia* they will bring the Fishes into the very *Kitchen* to the *Cook*. See some Observations of this Animal in the *Philos. Trans.* N. 124. He breeds every where.

(b) Gefner
out of Olaus
Magnus.

The QUILLS of a PORCUPINE. *Tela Histrice*. The Animal is described by *Aldrovandus*, and others; but the *Quills* not so fully. They are very smooth, and thick as a Goose-quill. With black and whitish portions alternately from end to end. Their Root $\frac{1}{2}$ of an Inch long. Their Point not round, but flat and two-edg'd, like that
of

of a Sword, or of some Needles. So that they both bore with their Point, and cut with their edges at the same instant, whereby they wound the more surely.

The *Porcupine* erects his *Quills*, at his pleasure, as a *Peacock* doth his Tail. And, partly by stretching his *Skin*; (a) (a) *Gesner out of Solinus.* shoots them at his pursuing Enemy. It may also be noted, That being rooted so little a way in the Skin (nothing near so deeply as the *Quills* of Fowls) they are the more easily ejaculated. They breed in *India*, *Africa*, and *Ethiopia*.

An *HEDGHOG*, or *Urchan*. *Echinus*, *Herinaceus*. See him describ'd in *Aldrovandus*. Anatomiz'd in *Bartholine's Acta Medica*. The *Urchan*, though a *Viviparous Animal*, yet hath his *Testicles* lying within his Body, as in the *Oviparous* kind. (b) In the Island *Maraguan*, in the North of *Brasile*, are some *Urchans* very great, almost as big as Boars. (c) He makes his Bury with two Entries, to the North and South; and according to the weather and season, keeps the one stopt up, the other open. (d) The Liver, Stomach, and fat of this Animal are sometimes medically used. (b) *Arist. H. Anim. l. 3 c. 1.* (c) *Joh. de Lact. (out of Abbavilanus) lib. 16. c. 15.* (d) *Gesner, out of Plutarch.*

The *GREAT SHELL'D HEDGHOG*. By the Natives of *Brasile*, called *TATU*; By the *Spaniards*, *ARMADILLO*; as Names common to the several species. And by *Latin Authors*, *Echinus Brasiliensis*. This once belonged to the Duke of *Holstein*. See the Description of this Species in *Clusius*, and others.

Those Creatures which are cover'd with Feathers, Scales, or Shell, saith *Aristotle*, (e) have no *Auricula* or outward Ear. So that he never saw this Animal; nor many others now known, and some which he ventures to describe; as appears by those general Assertions, whereof he is too often guilty. (e) *Histor. Anim. lib. 1. c. 11.*

He gathers himself up, Head, Feet and Tail, within his Shell, as round as a ball: as *Piso* hath also pictur'd him. (f) And this he doth, not only when pursued, but also when he sleeps. Unless he be ty'd, he will dig out his way under the very walls of a house. (g) For it is his nature to dig himself Buries, as the *Coney* doth; which he doth with very great celerity. (h) (f) *Hist. l. 3. S. 3.* (g) *Mus. Septal.* (h) *Clusius.*

For the tenderness, whiteness and delicacy of his Flesh, he is reserved for Feasts; (i) and therein prefer'd before either (i) *Barlaeus de Rebus Bras. p. 222.*

(a) Guil.
Piso.

(b) P. 369.
out of Franc.
Ximines.

either Conies or sucking-Pigs. (a) The Plates of his Shell being powder'd and given in a draught of the Decoction of Sage in the quantity of ʒi, provoketh sweat; and are a singular remedy against the *Lues Venerea*, saith *Barlaeus*.

(b) If it provoketh sweat, it may be used to good purposes, whether it cureth that Disease, or no.

The **PIGHEADED ARMADILLO**. *Tatu Porcinus*. *Nierembergius* hath described this *Species*, but yet imperfectly. The best of any *Wormius*; who also omiteth some particulars, and in others is mistaken.

From his Snout-end to his Tail, about ten Inches and $\frac{1}{2}$; being younger and lesser than that of *Wormius*. His Body four Inches over. His Head an Inch and $\frac{1}{4}$, and three Inches long. The end of his Nose scarce half an Inch over, shaped like that of a Pig; from whence I have taken leave to name it. His Ears not above $\frac{1}{4}$ of an Inch distant one from the other. His fore-foot two Inches and $\frac{1}{2}$ long, above $\frac{1}{2}$ Inch over. On which he hath four Toes; the two foremost of which are an Inch long, the other two $\frac{1}{2}$ an Inch. The hinder-foot of equal length, but thicker. On which there are five Toes; the three foremost, and thickest whereof are an Inch long, the other two $\frac{1}{2}$ an Inch. His Tail about 11 Inches long, at the Buttocks an Inch and $\frac{1}{4}$ over, at the end as small as a *Shoomakers* waxed Thread.

His Head, Back, Sides, Legs, and Tail, are all cover'd with a shelly Armour. His Head, with Shells, Scales for the most part, five and six angled. His Shoulders, with round ones, and lesser, about $\frac{1}{4}$ of an Inch over; betwixt which other lesser ones are interjected. The Back-piece consisteth of about ten shell Plates, joyned together by the mediation of as many parallel Skins. Every Plate is about $\frac{1}{2}$ Inch broad, curiously composed of small triangular or wedge-like pieces, indented one against another, and pounced or pricked all along their edges. His Buttocks adorned in the same manner as his Shoulders. His Shell ending next his Tail, with an *Elipsis*. The fore-part of his Tail is encompass'd with shelly Rings, in number eleven; composed not of triangular, but sixangl'd and square pieces. The other half with Scales set together, as on his Head. His nether Buttocks, Belly, Breast, Neck, and Ears are all naked. His
Eyes

Eyes black, round, and very little; resembling a black Bead of the bigness of a Vetch. His Grinders in each Chap about twelve. More properly Tunfores; because they are level and smooth on the top. No thicker than a great Needle. Besides these Teeth, I find none.

By the help of the aforefaid *Plates*, and parallel *Skins* together with the Muscles that lie under them, this Animal is able, like the Hedge-Hog, to gether up himself into a round ball. For the better performance of which action, Nature hath also left his Throath, Neck, Breast and Belly naked. As also his Ears, that he may turn them more expeditely for the reception of sounds from every quarter. His Eyes, like those of a Mole, very little, as most suitable to a Creature living for the most part in the dark, and under ground. His hinder feet, like a Conies, more strong, for the better working of his Buries.

Piso (a) maketh the action of conglobation peculiar to this *species*, but very falsely, as will appear by the following Description. (a) Hist. l. 3. S. 3.

The WEESLE-HEADED ARMADILLO. *Tatu Mustelinus*. I find this *species* no where describ'd. For that Description of a third *species* in *Clusius*, was taken only from some Picture, no way answering to the Animal before us.

His Head in figure almost like a *Weefles*, whence I take leave for his Name. 'Tis three Inches and $\frac{1}{2}$ long; his Forehead two Inches and $\frac{1}{2}$ broad, and very flat; the end of his Nose $\frac{1}{2}$ Inch. His Eyes small, $\frac{1}{4}$ of an Inch long. His Ears two Inches distant one from another; an Inch long. His Body or Trunk 11 Inches long, about six broad. His Tail $5\frac{1}{2}$ long; near the Buttocks an Inch and $\frac{1}{4}$ over, the extremity $\frac{1}{2}$ of an Inch. His fore-Leg two Inches and $\frac{1}{2}$ long, $\frac{1}{4}$ broad. On which there are five Toes; whereof the three foremost are an Inch long, the other two half an Inch: all with Claws the $\frac{1}{2}$ of an Inch. On his hinder foot (which is somewhat bigger) he hath also five Toes, as in the foremost.

His Head, Back, Sides, Legs, and Tail are cover'd with a shelly Armour. His Head-piece, as also the shells on his Legs, are composed of roundish Scals, a $\frac{1}{4}$ of an Inch over. His Neck-piece is a single Plate, composed of little pieces, a $\frac{1}{4}$

of an Inch square. His Shoulder-piece consisteth of several Ranks or Rows of such like square pieces, but not set together by any Articulation, or movable Conjunction. His Back-piece, reaching also over his Buttocks to his Tail, is composed of several Plates, in number eighteen, moveably joyned together by as many intermediate Skins. The foremost and greatest of these Plates, consist of square pieces $\frac{1}{2}$ Inch long, and a $\frac{1}{4}$ broad. The hindermost, of square and round ones together. The extream part of the Shell next the Tail, is Parabolick. The fore part of the Tail is surrounded with six Rings; consisting of little square pieces. The other half with Scals. His Breast, Belly, and Ears all naked; for the same purposes, as in the former.

This *Species*, by the greater number of Plates, seemeth able to draw, especially his hinder parts, more roundly inward, than the other.

The FLYING SQUIREL, *qu. Sciurel*, from *Sciurus*. Not described, unless by *Scaliger*. The colour of his Body a dark grey. Of his Tail, almost that of straw. Lesser than the common Squirrel, not above five Inches and $\frac{1}{2}$ from his Nose end to his Buttocks. His Skin, from his Sides, Thighs and Legs (almost as the wings of a Bat) is stretched out about an Inch in breadth, or more or less at his pleasure: by means whereof he leaps further, and alights the more safely; and is therefore called *The flying Squirrel*. In other respects, like the *Europæan* kind. It was sent from *Virginia*, its breeding place.

He seems to be the same Animal which *Scaliger* describes under the Name of the Flying Cat. *Exercit. 217. S. 9.*

The Squirrel, when he hath a mind to cross any water for a good Nut-Tree, picks out, and sits on some light piece of Barque for a Boat, and erecting his Tail for a Sail, he makes his Voyage. (a)

(a) Gefner,
out of the
Author of the
Book, de
Naturâ Re-
rum; out of
Vincētiū,
Beluacensis,
and Olaus
Magnus.

CHAP.

CHAP. II.

Of VIVIPAROUS QUADRUPEDS,
Particularly such as are BIFIDOVS, and
SOLIDIPEDOUS.

THE LEG of a GREENLAND STAG. It is scarce four Inches long. Nor above $\frac{1}{3}$ ^d of an Inch over. Cover'd all over with very short hair, of the ordinary russet or reddish brown colour. The hoofs somewhat black, $\frac{1}{2}$ inch long, $\frac{1}{3}$ broad, and $\frac{1}{4}$ high. Given by Mr. Palmer.

The BONES of a STAGS heart. About an inch and $\frac{1}{4}$ long, and $\frac{1}{4}$ broad. Very thin, but yet hard and solid. They seem to be a help for the stronger and more steady motion of the Muscles of the heart. Butchers often find the like in the heart of an Ox; which are easily substituted for the former: and I would as soon trust the one, as the other.

A STAGS TEARS. A thicken'd Excretion from the inward Angle of his Eye. In colour and consistence almost like to Mirrh; or Ear-wax that has been long harden'd in the Ear. Of a strong stinking smell, like that of the Animal's sweat. They are generally affirmed to be sudorifick, and of an Alexipharmick nature. And if they were as easie to be had, as some Womens, it were worth the trying.

They are quite a different thing from that little round and hard Bone, which Scaliger describes ^{(a) Exerc.} by the Name ^{112.} of *Lachryma Cervina*, and which he affirms to grow in the great Corner of a Stags Eye to the Bone, after an hundred years old. I doubt a stranger sight, than the *Ludus Secularis*; such as no man (but himself) ever saw, or shall see.

The MUSK DEER. *Capreolus Moschi*. Gesner reckoning up the Names, tells us, That the *English* call him a *Musk Cat*. But is better at other Languages. He breeds in *China*, and the *East Indies*. Not ill pictur'd

in

in *Calceolarius's Musæum*. That in *Kircher's China Illustrata* faulty as to the Snout and Feet. That of *Johnston* absurd. Almost every where worse describ'd. That he is a two-horn'd Animal, says *Aldrovandus*, all agree, except *Simeon Sethi*, who saith he hath but one. Neither of which is true. The Description likewise given by *Scaliger*, and out of him by *Chiocco* in *Calceolarius's Musæum* is false, and very defective. The best I find is amongst the *German Transactions*. To which I would have refer'd the Reader, but that comparing it with That I had drawn up before I met with it, I see some differences.

From his Nose end to his Tail, a yard and $\frac{1}{2}$ a foot long. His Head above $\frac{1}{2}$ a foot. His Neck $\frac{1}{4}$ of a yard. His Forehead three inches broad. His Nose end scarce $\frac{3}{4}$ of an inch, being very sharp, like that of a Grey-Hound. His Ears like a *Coneys*, about three inches long, and erect. As also his Tail or Scut, which exceeds not two inches. His fore-Leg a foot and two inches long, taking in Foot and Thigh. Near an inch over: the Foot deeply cloven; with two fore-Hoofs, an inch and $\frac{1}{4}$ long, each $\frac{1}{4}$ of an inch over; and two Heels, almost as big, and therefore conspicuous. His hinder feet are here wanting.

His hair on his Head and Legs about $\frac{1}{2}$ inch long, and rateably small. On his Belly an inch and $\frac{1}{2}$ long, and somewhat thicker. On his Back and Buttocks three inches long: thicker in proportion, than in any other Animal, except perhaps some of the Deer kind, *sc.* three or four times as thick as Hogs Bristles: consisting of brown and white portions alternately from the Root to the top. On the Head and Legs, brown; On the Belly and under the Skut, whitish. As it were frizled, especially on the Back and Belly, by a kind of undulation. Softer than in most Animals, and exceeding light and rare. For being split, and view'd with a Glass, they appear to be made up of little Bladders, like those in the Plume or Stalk of a Quill: so that it is a thing betwixt a common Hair and a Quill. On each side his lower Chap, almost under the corners of his mouth, there is a peculiar Tuft (about $\frac{3}{4}$ of an inch long) of short, thick and hard hairs, or rather Bristles, of equal length, as in a scrubbing-Brush.

The Musk Bladder or Bag is about three inches long,
two

two over, and swelling out from his Belly one and $\frac{1}{2}$. Standing before his Groin about as much. I find it cut open, whereby the observation of its natural Aper-
ture (which I suppose it hath as the Castor-Bag) is pre-
vented.

He hath 26 Teeth. In his lower Chap, sixteen; of which there are eight little Cutters before; behind, four Grinders on each side, rugged and continuous. As many like Grinders in the upper Jaw. About an inch and $\frac{1}{2}$ from the Nose end, in the same Jaw, on each side a Tusk, two inches and $\frac{1}{2}$ long, hooked downward, and backward, and ending in a point. Not round, but flat, the breadth of $\frac{1}{2}$ an inch; thin, and having a sharp edge behind: so as it may not unfitly be liken'd to a Sithe. There are no Horns.

The Hair of this Animal, by its softness and rarity, are a singular contrivance of Nature to keep him warm. For all Garments, the softer and rarer they are, (*cæt. par.*) they are the warmer. For the same cause, the Hair on his Back, is also the longest; *sc.* for the better protection of the *Spinalis Medulla*. His two Tusks, by the Figure, appear to serve for fighting partly, and partly for feeding; by the help whereof he is able either to stub up edible Roots out of the ground, or to tear off the Barques, or break down the Boughs of Trees. By the help of his great Ears, he hears his approaching enemy the further off, to make his flight. So also the *Hare*, being a fearful Animal, hath the like. Nature hath furnished him with great heels, both to enable him to make the greater leaps, and to light also upon his Feet the more safely, for by their means, the force of his weight is gradually broken.

Scaliger's mistakes (*a*) about this Animal, are principally these two; In saying his Tusks grow out of his nether Jaw; and in calling the Musk, A postemated Blood. For he might as well call Civet and Castor the Blood of those Animals that yield them. And if it were apostemated, it would not be separated from the Flesh, but contiguous to it: whereas it is plain, that the Musk was here inclosed on all sides, in an entire Cystis or Bag made by nature for that purpose.

(a) Exercit.
tat. 21.

The VELVET HORNES of a *Greenland Roe-Buck*.

Buck. They are a yard high, with numerous, and round Branches. Covered all over with an ashcolour'd hair, a $\frac{1}{4}$ of an inch long, and standing upright, as the *Pile* of Velvet.

The HORNES of an *Indian Roe-Buck*; which the people of *Brasile* call *Cuguacu-apara*. See the Description of the Animal in *Marggravius*. His Picture in *Johnston*; but under the name of the *Capreolus Marinus*.

The HORNES of a *Roe-Deer* of *Greenland*. They are very little more than an inch long, and half an inch over. They are pointed at the top, and knobbed or tuberos at the bottom.

(a) Joh. de Laet. from the Observation of Alphonfus de Benavides.

Deer in *New Mexico* so big, (a) that they breed them up to draw with, as we do with Oxen and Horses. So strangely does the Climat alter the Bulk of some Animals. Deer, and they only, may be suppos'd to cast their horns, because they have neither a long Tail, as Oxen; nor so long hair as a Goat or a Ram; by either of which is made a continual consumption of the same matter, which in Deer goes into the horns. The horns of Deer, are of all other the fullest of Volatile Salt. Which may lead us to conjecture of the like nature of his flesh, and blood; and the cause of his great falacity.

(b) Chap. 39.

The ROCK-DOE. *Ibex fœmina*. A kind of wild Goat. See the Description of *Pliny*, and *Bellonius*. She breeds chiefly upon the *Alps*. A Creature of admirable swiftness. And may probably be that very *Species* mention'd in the Book of *Job*. (b) Her horns grow sometimes so far backward, as to reach over her Buttocks.

The HORNES of the WREATHED-Horn-Goat, or *Antilope* of *Barbary*, called *Capra Strepficerotes*, and *Gazella*. See the Description of the Animal in *Wormius*. These Hornes are about a foot and $\frac{1}{2}$ long. But in *Septalius's Musæum* there is one pair said to be above a yard in length. They are twisted into a kind of spiral shape, but the Rings which seem to be spiral, are really circular.

The BONE of the ANTILOPES HORN; which is solid, and also spiral or twisted, but without Rings. Given by *Henry Whistler Esq;*

The HORNES of the SYRIAN GOAT; called *Capra Mambrina* i. *Syriaca* being. *Mambre*, a Mountain

tain near *Hebron*; where about, chiefly, this Goat breeds. (a) See *Gesner's* Description of him. And compare it with the Picture he gives, which seemeth to be the truer, as to the horns. His Ears are so long, (b) as to reach almost to the ground. A sufficient supplement for the shortness of his horns: being not above two inches and $\frac{1}{2}$ long, and a little crooked backward, almost like a Dogs Tooth.

(a) *Gesner*
in his Para-
lypom.

(b) *Gesner*
ibid.

The HORNES of a DOG-GOAT. I find them inscribed, The horns of a Dog. *Johnston* giveth the figure of the Animal, without any Description. According to that figure, he is headed like a Dog, and of the bigness of a Tumbler. But footed, and horned like a Goat. To whose also the horns here preserved are like in colour, and somewhat near in shape: but nothing near so big; being not much above two inches long. Not only the horns themselves, but also the bones whereon they stand, are hollow to the top. They were sent from a certain Kingdom near *China*.

The HORNES of a HARE; so I find them inscribed. Although it is probable, that they are the horns of a small kind of *German* Deer. Yet *Wormius* saith, There are horned-Hares in *Saxony*. See also *Gesner* of the same. *Johnston* gives the Picture, without a Description. This pair, once belonged to the Prince Elector of *Saxony*.

A pair of very great *English* Rams HORNES.

The HORNES of a *Spanish*-Ram. In length, $\frac{3}{4}$ of a yard. The Tips a yard distant. Somewhat flat, wrinkled, and twisted, as those of an ordinary Ram.

The HORNES of a *MUSCOVY*-Ram. I meet no where with the Description of the Animal, or these Hornes. He seemeth to be of kin to the *Hircus Cotilardicus*, which *Johnston* hath pictur'd. These horns are black: and somewhat wrinkled. Consist of four Branches: The two greater whereof are a foot long, and as thick as an ordinary Rams, very strait, standing in the form of the letter V, or like the legs of a pair of Compasses, and a little writhen. The two lesser are seven inches long, not so thick, winding downward, and inward one towards another, in the form of two half Moons. The points of all four very blunt.

A very great HORN of the ROCK-BUCK, or
E of

of the *Ibexmas*. In shape almost like a bended Cross-bow. By the string, $\frac{3}{4}$ of a yard long; but by the bow, about an Eln. It was formerly tipp'd with silver, and kept in a Gentlemans house, and shew'd (to some special Friends) for the Claw of a *Griffin*. See the figure hereof in *Moscardus's Musæum*.

The HORNES of a WILD BULL; called *Bubalus sive Buffalus*. They are broad at the Roots, but grow very sharp of a sudden; and bended inwards about the middle; so that the Tips are not above two inches distant. See the Animal describ'd in *Bellonius*, and others. He is much bigger than the *Europæan* Bull. This kind breeds most in *Asia*. But they are also kept in *Italy*, in their Cities. In *India* they sell the Milk of the Female about the streets, as they do Cows Milk here. The Leather call'd *Buff*, is made of the Hyde. These Hornes were brought from *Africa*.

The HORNES of the BUNCH-BAK'D BULL. *Cornua Bifontis*. This pair belongeth to that *Species*, which hath a great Maine. These, contrary to the former, stand wide, and especial upwards, their Tips being $\frac{1}{2}$ an Eln distant. See the Description of the Animal in *Aldrovandus*, his Picture in *Johnston*. He is swifter than any other Bull, and untameable. He breeds in *Lithuania*. To the hornes is joyn'd the fore-part of the skull, together with the skin, which is very thick and tough. The skin of any Bulls Forehead, either for its toughness, or other cause, is the only part of the Hyde made use of by *Horners*, whereupon they shave their Hornes (which they take out of a Tub of warm water by them) to fit them for *Lamp-horns*.

The TAIL of an *Indian* COW. The Male is call'd *Bonafus*. The hairs hereof are greyish. Above a yard and $\frac{1}{2}$ long. Yet almost as soft and fine as a *Womans*. The Cow is said to be worshipped by the people that live near the River *Ganges*.

A little STONE out of an Oxes Liver. Inscribed *Tetraedrum inventum in Hepate Bovis*. But I find it broken into several pieces. It is just of a liver-colour. And is compos'd, as the *Bezoar* Stone, of several crusts or soft shells one over or within another.

A MON-

A MONSTROUS CALF with two heads. Each head is a little less than usual; the rest of the parts according to Nature.

The SKIN of a CALF with two heads, tann'd with the hair on. There is a very strange story of a Monstrous Calf in the *Philos. Transf. N. 1. & N. 2.* compar'd together: communicated by the Honourable Mr. Boyle.

The TUSK of a Wild BOAR. It winds about almost into a perfect Ring or Hoop; only is a little written. In measuring by the ambit, 'tis long or round about a foot and two inches. Its basis an inch over. Almost all the way triangular, especially towards the point.

Another BOAR-TUSK, somewhat slenderer, and of a semiannular Figure.

The wild Boar breeds in *Helvetia*, especially near the Alps. In *Barbados* very great. Ligon (a) saith, he saw there one so big, that when his head was off, and his entrails taken out, weighed 400 l. It was well observed by Aristotle (as to those Beasts which he had seen) that no one was horned and tusked too: (b) the superfluous parts of the blood proper for their production, not being sufficient to feed them both.

The SKULL of the HORNED HOG. By the people of the Island *Bouro*, not far from *Amboina*, he is called *Baby Roussa*. (c) See the Picture hereof in *Bartholine*, (d) taken in *Java*, from whence he received it. As also the Description, though but imperfect. See likewise *Guilielmus Piso*, (e) who gives a figure somewhat different, making him slenderer and shaped in Body like to a Deer. But his Description seems to be taken out of *Bartholine*. His principal Characters are these, About as big as a Stag, snouted and tailed like a Boar, footed like a Goat: besides what is observable in the skull, which I shall now particularly describe.

It is a foot long, seven Inches high, and about five over. The Snout scarce two. The Teeth are 32. In the upper Jaw, four Cutters; in the nether, six. In each Jaw, ten Grinders. In the lower Jaw, two Tusks, one on each side, like those of a Boar, standing outerly, an inch behind the Cutters; near their Root, $\frac{3}{4}$ of an inch over, sharp-pointed, hooked very much backward; by the bow, four inches long.

(a) Histor.
Cent. 2.

On his upper Jaw, he hath two *Horns*, of the same hardness and substance with the two great Teeth now describ'd: and *Bartholine* (a) calls them Teeth. Yet are they not Teeth, but *Horns*; because they are not, as all Teeth, even the Tusks of an *Elephant*, fixed in the Jaw with their Roots upward, but downward: and so their *Alveoli* are not open downward within the Mouth, but upward upon the top of the snout: where these *Horns* bore or pierce the flesh and skin, as the Teeth do the Gooms. Yet being two, they stand not in the middle, as in the *Rhinoceros*, but on the sides of the snout, *sc.* behind the Cuters about two inches. Near their Roots about half inch over, ending in a sharp point, bended upward and backward like a fish-hook, by the bow about $\frac{1}{2}$ a foot long.

(b) In Bont.
Hist. N. Ind.
Orient. l. 5.
c. 9.

Piso (b) describing of it, saith, That in his nether Jaw (his upper Jaw he describes after) there are two great Tusks which stand upright, and bore through his snout (*Rostrumq; perforantes*): which is a senseless mistake. *Bartholine* indeed saith of the Horns (which he calls the Teeth) of the upper Jaw, --*prodeunt ex superiori Maxilla carnem Rostris perforantes*: which *Piso* transcribing, mistakes, and feigns as great an absurdity, as if Nature had put a Padlock or Bolt upon the Creatures Mouth.

Aristotle, as was before noted, said well, as to the Animals he had seen, That no one hath both Tusks and Horns. But of his fault in affirming too generally, this Animal is not the only instance, by many. The reason why this hath both, may be, because neither of them are very great, and his Horns, proportionably to what they are in others, are very little. Besides that he is cover'd with hair, and not, as the Boar, with Bristles, which probably spend more upon the same matter, which in other Creatures makes the Horns. For *Bristles* seem to be nothing else but a *Horn split into a multitude of little ones*.

(c) *Piso* in
Bont.

This Creature is said (c) to breed only in the Island *Bouro*. Yet that which the *Brasilians* call the *Tajacuguitas*,

(d) Joh. de
Lact, out of
Lerius.

(d) may be the same. As also *Pigafeta's Porcus Quadricornis*. There are Swine, saith he, (e) in the *Philippick* Islands,

(e) Cited by
Aldrovandus.

with two, three, and four Horns. He might mistake the two Tusks for Horns; and from those which he saith had but two or three, they might be violently broken off.

Another

Another SKULL of the BABY ROUSSA. It is altogether like the former, saving that the Tusks and Horns are not so crooked. So that one seems to be of the elder, or the Male, the other of the younger, or else the Female. Both the Natives, and others that live amongst them, esteem this Animal a delicate sort of Venison. (a)

(a) Piso in
Bontius.

The SKIN of a young RHINOCEROS, composed indifferently to the shape of the Animal. In the Description whereof *Jacobus Bontius* (b) comes the nearest to the truth. Yet is he very short and defective. To whose therefore, as far as may be by this Skin, I shall add a better.

(b) Histor.
Nat. Ind.
Orient.

'Tis a yard long, and almost a foot over; his head nine inches long, almost eight over at the top. His Snout broadish, as in a Calf. His Eyes little, as those of a Hog, about $\frac{1}{4}$ of an inch long. They stand low, not much more than three inches above his Nose end. His Ears also like a Hogs. His Legs, as of the *Hippopotamus*, rateably short; about ten inches long. His Tail, five and $\frac{1}{2}$; flat, as that of the Castor; but not so broad, near the Buttocks an inch and $\frac{1}{2}$, at the end $\frac{1}{2}$ an inch.

The said Skin is every where thick, and very hard; excepting only his Ears which are softer, and extream thin. It hath about ten *Plicæ* or Folds; two under the nether Jaw, one on the Breast, in the figure of the letter V, on the Neck one on each side, one between the Shoulders semi-circular, on the Back two transversely extended to the bottom of the sides, with two more strait ones, carry'd obliquely on the Buttocks.

The lower part of the Forehead and Snout cover'd with a kind of hard Crust. His Ears naked and smooth. All the other parts rough with round scaly Crusts; on the Back, Sides, and Belly, lesser, near a $\frac{1}{4}$ of an inch over; on the nether Chap and Shoulders, bigger; on his Buttocks and Legs, the biggest, about $\frac{1}{2}$ an inch over. His Hair is black, short, and fine. So few, that there are not many more than scales or shells; growing for the most part, out of the centre of the shell; so that he is almost naked. His Dock is also naked on both sides, but on the edges there grows a considerable quantity of longer and thicker Hair. The Animal being very young, had no Horn, nor so much as any sign of it.

The

(a) Histor.
Nat.

(b) Ibid.

The *Rhinoceros*, says *Bontius*, (a) is near as big as an *Elephant*, saving that he is not so tall. He will lick a Man to death, (b) by raking away the flesh to the Bone with his rough and sharp Tongue.

In *Piso's* Figure, which he hath added to *Bontius's* Description, and which, he saith, was taken from the life, the Eyes are placed very low, as they are also in this Skin. But the Cloven-Feet, in the same Picture, I find not here: peradventure, the Skin not being well taken off the Feet.

(c) Mart.
Epigr. 22. &
Epigr. 9.
lib. 1.

In the time of *Domitian* the Emperour, there was one so big, as to toss not only a Bear, but a Bull upon his Horn. (c) But what *Martial* means, speaking of the *Rhinoceros*,

Namq; gravem gemino Cornu sic extulis Ursum, &c.

I do not well understand. The Figure given by *Piso*, as above, represents but one Horn only. Neither doth *Bontius* (who saith he hath seen great numbers of them both in houses and in the woods) describe or mention any more than one Horn. And those who do speak of another, yet make it a very small one, and not over against the other, but on the forepart of his back, and so in a place where it is immoveable, and can no way be made use of for the tossing up of any thing, as the other on his Nose.

(d) Linschot
p. 88.

The *Rhinoceros* breeds not in *India*, (d) but in *Bengala* and *Patane*, where they much frequent the River *Ganges*.

A piece of a great RHINOCEROSSKIN, tann'd. 'Tis wonderful hard, and thick, about $\frac{1}{2}$ inch; exceeding that of any Land Animal which I have seen.

The HORN of a RHINOCEROS. It once belonged to the Duke of *Holsteine*. Although *Bontius* describes the Animal the best of any before him, yet neither he, nor others describe the Horn to any purpose. 'Tis in colour and smoothness like those of a Bull. Almost a yard long. At the base, above half a foot over; and there surrounded with a Garland of black and stubby Bristles. Sharp-pointed. A little crooked backwards, like a Cocks Spur. Quite through solid. An instance contrary

trary to that Assertion of *Aristotle*, (a) Ἐστὶ δὲ τὰ κέρατα δι' ὅλα σπερὰ τοῖς ἐλάφοις μόνοις. (a) De Partib. Animal. l. 3. c. 2.

Another HORN of a RHINOCEROS, as big as that now describ'd. Given by Sir *Robert Southwell*, present Ambassador to the Prince Elector of *Brandenburge*.

A THIRD, almost as big as the former.

A FOURTH, a little one, about a foot long.

The *Rhinoceros* fights the *Elephant* with his Horn, and sometimes overcomes him. In *Septalius's Musæum* there are several Vessels mention'd to be made out of this Horn, as well as divers others. The *Rhinoceros* Horn, in *India*, as also his Teeth, Claws, Flesh, Skin, Blood, yea Dung and Piss, are much esteemed, and us'd against Poison, and many Diseases; and sold at great rates. (b) Yet some for an hundred times as much, as others of the same colour and bigness; for some difference which the *Indians* (only) discern betwixt them. (c)

(b) Linsch.
p. 88.

(c) Ibid.

The TAIL of a great RHINOCEROS. Not well described by *Bontius*. The Dock is about $\frac{1}{2}$ inch thick, and two inches broad, like an *Apothecaries Spatule*. Of what length the whole, is uncertain, this being only part of it, though it looks as if cut off near the Buttock; 'tis about nine inches, black, and very rough. On the two edges, and there only, grow also very black and shining hairs, a foot long, stubborn, and of the thickness of a smaller *Shoomakers* Thread. Yet not round, as other hair, but rather flatish; like so many little pieces of Whale-Bone.

A SPIRAL or WREATHED TUSK of an ELEPHANT. Presented from the Royal *African-Company* by *Thomas Crispe Esq.* 'Tis about an Ell long. At the base, a foot about. From the thin edges whereof, it is conically hollow to the depth (or height) of near $\frac{1}{2}$ a yard. It is twisted or wreathed from the bottom to the top with three Circumvolutions, standing between two strait lines. 'Tis also furrow'd by the length. Yet the furrows surround it not, as in the horn of the Sea-Unicorn; but run parallel therewith. Neither is it round, as the said Horn, but somewhat flat. The Top very blunt.

Pausanias (cited by *Gesner*) affirms, and seems to speak it as a thing well known, That the Tusks of *Elephants*, which he calls, and useth arguments to prove them Horns, may,
by

by the help of fire, like Cows horns, be reduced to any shape. Whether this be naturally twisted, or by art, I will not determine. *Terzagi* in *Septalius's Musæum* mentions though not a Spiral, yet strait Tusk of an *Elephant*, two yards high, and 160 pounds in weight.

The LEG BONE of an ELEPHANT. It was brought out of *Syria* for the Thigh-Bone of a Giant. But the proportion which the thickness bears to the length of the Bone, shews it to be the Bone not of a Man, but an *Elephant*. For the Leg-Bone is usually about $\frac{7}{8}$ of an inch over: and so its transverse *Area* contains about (49) square eighths of an inch. But this Bone is above four inches over; in the transverse *Area* whereof therefore, are contained about (1088) square eighths of an inch. Which number (1088) being divided by (49) gives (22) for the Quotient. So that it is two and twenty times as thick as the Leg-Bone of a Man: I mean, the transverse *Area* of the one containeth that of the other 22 times. Yet is it but three times as long; and therefore should contain the same but about nine times, were it the Leg-Bone of a Man. 'Tis about a yard and $\frac{1}{2}$ foot long, and above a foot about in the slenderest part. And the shape of it, shews it to have belonged to the Leg, and not the Thigh. The *Elephant* to which it did belong, might be about five yards high.

Another LEG-BONE of an ELEPHANT, scarce so long, but of equal thickness. Given by *Sir Thomas Brown* of *Normich*.

Elephants are brought into *Europe* out of *Ceylan*, *Sumatra*, *Cochin*, *Siam*, *Bontam*, *Melinda*, &c. But they breed most in the Kingdoms of *Aracan* and *Pegu*. (a) In the Island of *Ceylon*, most docile. The *Æthiopians* behind *Mosambique* eat them, and sell their Teeth. The *Indians* use them to draw, and ship their Goods. In Winter, when it begins to rain, they are altogether mad and ungovernable, and so continue from *April* to *September*, chain'd to some Tree; after that, they become tame and serviceable again. (b) See more of the nature, and ingenuity; and of the way of hunting and taming them, in *Linschotus* and *Tavernere*. (c)

One of the GRINDERS of an ELEPHANT. He hath four of these Teeth in each Jaw, wherewith he grinds his meat. This here is above a foot long. But the

(a) *Lincol.*
p. 29. &c.

(b) *Ibid.*

(c) *East. Ind.*
Voyage.

the exerted part, or that part which stands above the Goomes, is but seven inches in length, and three in breadth. 'Tis not above $\frac{1}{2}$ an inch above the Goomes, but fasten'd within the Jaw $\frac{1}{2}$ a foot, where deepest. The said exerted part looks like eight or nine Rows of Teeth, three, four, and five in a Row, all coalescent. The sides all along waved. The furthestmost Roots like the folds of an old set Ruff. It weighs above eleven pounds and $\frac{1}{2}$ *Haver-du-poyse*.

ANOTHER of the same Teeth, somewhat lesser.

A THIRD, having part of it broken off.

The *Elephant*, in my mind, hath some affinity with the *Boar*. Both are Taper-Tail'd, hunch-back'd, little-Ey'd, arm'd with Tusks, have the nether Chap sharp before, and a moveable Snout; the *Elephants Proboscis* being but a long Snout, and the *Boars* Snout a short *Proboscis*.

The HOO F of a *Solidungulous* Animal. It was brought from *Angola*. Perhaps of a kind of *Zebra* there, answering to the *Indian* described by *Pigafeta*. 'Tis much about the shape of a Horse's, but not so big; two inches and $\frac{1}{2}$ broad, two inches long, and as much in height. Somewhat thick and strong. For the greatest part, blackish; but just before yellowish, and half transparent. Within this is contained another young one (together with its inclosed Bone) all over of a yellowish colour. The *Zebra Indica*, (a) is in all his parts like a *Mule*, saving that it is not barren.

(a) Aldrovandus.

Another strange HOO F of a *Solidungulous* Animal. It is of a blackish brown and opacous colour. Very thin, like that of a Calf. But rateably much broader than in other Animals, being not much above an Inch over forward, yet expanded side-ways two inches and a $\frac{1}{4}$.

Another HOO F of the former kind, a little less, blacker, and altogether opacous.

APPENDIX.

Of certain BALLS found in the Stomachs of divers Beasts.

ANAKED and round HAIRY BALL; almost three Inches over, taken out of the Stomach of a Calf.

Another somewhat Oval, and more compact.

Several other lesser ones, and with the hairs more loosely composed.

Another, with the outward parts of the hair not complicated, as in the former, but standing parallel, and somewhat winding, as in the Crown of a Mans head.

Two HAIRY BALLS, SPHÆRICAL, and INCRUSTATED. About two inches Diametre, cover'd with a smooth and very thin Crust, of the colour of Occidental *Bezoar*, having neither tast or smell, nor stirring at all, upon the effusion of Acids.

A HAIRY BALL, incrustated, and FLAT. Taken out of the stomach of a Bull in *Brasile*. 'Tis very smooth, and of the colour of Oriental *Bezoar*. Figur'd just like a Bowl. Somewhat above two inches thick, and three, over. *Ferranti Imperato* (a) hath another like it. If you scrape a little of the Crust off, and pour spirit of *Nitre* upon it, it makes a conspicuous bullition, as it doth upon *Bezoar*. (b)

(a) Lib. ult.
(b) See the Author's Discourse of the Lucretian arising from the mixture of Bodies.

Another BALL, in figure, colour, and substance, like the former; but bigger, being above three inches Diametre.

It was taken out of the stomach of a Cow.

Another with the like Incrustation, but of an Oval Figure.

A FIBROUS BALL. Consisting, not of Hair, but for the most part of the fibers of Plants. Perfectly Sphærical. An inch and $\frac{1}{2}$ Diametre. Cover'd with a brown, and very rough Crust. The like substance being also mixed with the most intimate parts of the Ball.

Another like Ball, but somewhat less.

Half a FIBROUS BALL taken out of the stomach of

of a Sheep. Two inches over, and a little flat. It consisteth of most fine herby Threads or Fibers, short, and very closely compacted. Cover'd with a black, shining, and most thin Cuticle. A piece hereof fired, burns like Match-cord, all away to ashes.

These Balls, especially those of Hair, we may suppose to be made by the motion of the stomach, which in these Creatures is very strong, and frequent: by which motion the Hair is wrought and compacted together, as Wooll is, by the Workmans hand, in the making of a Hat.

CHAP. III.

Of OVIPAROUS QUADRUPED'S.

A Femal LAND-TORTOIS. *Testudo terrestris femina*. Usually described, but no where fully, nor without errors. This here is eight inches long, and five broad. The Head an inch and $\frac{1}{2}$ long, almost as broad; in shape somewhat like a Toads. The Orbits of the Eyes very large, almost $\frac{1}{2}$ inch over; a $\frac{1}{4}$ of an inch behind the Snout. The lower Chap is received by a groove into the upper. The Tail three inches long, and sharp-pointed. The Feet two inches and $\frac{1}{4}$, and above $\frac{1}{2}$ inch over. The fore-Feet have five very short Toes, with Claws about $\frac{1}{4}$ inch long. The hinder feet have but four Toes, with somewhat bigger Claws.

The Head, Back and Belly, have all bony Covers, faced or over-laid with shells. The head and back-pieces blackish, with citrine or straw-colour'd specks sprinkled up and down upon them. The back-piece convex, and almost Oval. On the sides, for the length of two inches as it were doubled inwards, and joyned to the Belly-piece. 'Tis cancellated with little squares on the Margin; on the top of the back, hexangularly; and with the largest *Area's* between. The Belly-piece is party-colour'd black and citrine, almost flat; but turned up a little at the ends. Cancellated in the middle with squares, with triangles before, and behind with Hyperbolick lines. The Feet are cover'd with small round Scales, the Tail with square ones. He breeds in the Deserts of *Africa*.

Three little LAND-TORTOISES of the same kind.

Another little LAND-TORTOISE, of kin to the former. 'Tis somewhat rounder.

A lesser LAND-TORTOISE, almost circular and ridged on the back.

A great CHEQUERD TORTOISE-SHELL. *Testa Testellata major*. It was sent from *Madagascar*. I find the Animal no where describ'd or figur'd. It is above half oval; being of all that I ever saw, the most concave; a foot long, eight inches over, and almost six inches high.

The Convex is curiously wrought with black and whitish pieces, alternately wedged in, one against another, and notched, as it were, with transvers Incisions. Those near the Margines and on the sides are composed into several Pyramidal *Area's*, or great Triangles, whose Bases are about two inches broad. On the Back, into sexangular ones, each of them convex. On the sides, and quite behind, the Shell is carry'd somewhat inward. Before, and hinderly, the edges are toothed, and bended outward and upward. The inward edges are cover'd with shelly Plates above an inch and $\frac{1}{2}$ broad.

The Concave is composed of six and forty Bones. Along the middle of the Back, are twelve, all, except the foremost and the four last, almost square. Next to these, are eight on each side, like to so many contiguous Ribs; together with two lesser square Bones before: Next to these, eight more, as it were, under-Ribs, on each side. To the twelve middlemost Bones, the Ribs are joyned by an alternate commissure, so as one of them answers to the halves of two Ribs, & *vice versa*. To these, the under-Ribs, in a wonderful manner, *scil.* by a branched Suture or Indenture. For the great Teeth of the under-Ribs, being first inserted into those of the upper-Ribs; the Indenture is afterwards repeated, by lesser Teeth, out of the sides of the great ones. The Belly-piece is here wanting.

Besides the most elegant ordering of the Work in the Convex, there are three things chiefly observable, which serve for the greater strength of the Shell. That is to say, The *Convexity* of the several *Area's* on the Back, the
branched

branched Sutures, and the *Alternate commissures* of the Bones. Answerable to the Rule of Nature, in a *Humane Skull*: and of Art, in the laying of *Stones* in *Buildings*; and in covering of broader *Vaults*, not with one *Arch*, but several lesser ones, for the greater strength.

A lesser CHEQUER'D SHELL. Perhaps *Stellata Wormii*, (a) or a kin to it. The Convex work is composed of black and citrine pieces, cancellated, and transversely notched; ten, eleven, or twelve of them meeting in a square, and rugged centre; each looking like a Star surrounded with Rays. The several *Area's* rise up into a convexity somewhat greater, than in the Shell above describ'd. Just before the Tail, the edges are bended a little upward; over the Tail, downward. The Belly-piece is joyned to the Back-piece for the length of two inches and $\frac{1}{2}$, with the edges turned upward. The middle of it flat, streak'd, and cancellated; the hinder part endeth in a double broad point.

(a) See his Museum.

Two more CHEQUER'D SHELLS of the same *Species*; saying, That here are not so great a number of Rays to each Star.

Another of the same; excepting, that the several arched pieces are not so high, as in the former.

A CHEQUER'D-SHELL, from *Suranam*. I think no where describ'd, or figur'd, unless perhaps by *Moschardus*. The convex work is composed of black and citrine pieces, in the Margin, of a Pyramidal or wedged Figure, oppositely set, and with *transverse* Notches: amongst which there are also little square, rugged, and citrine pieces intermixed. All the rest, which are also black and citrine, are six times as big, adorned not with transverse but *parallell* Notches. Neither are they Radiated, but several of the same kind contiguous side to side. They are compos'd into *Area's* almost flat: the centres whereof are also rugged, but much bigger than in the Shell last described. The Belly-piece is also less convex.

Another of the same *Species*.

Another CHEQUER'D SHELL from *Suranam*, of kin to the last describ'd. The edges of this are round about, excepting before, turn'd up outward. The Back also is less convex; the Belly, more deep.

Another

Another of the same *Species*.

A CHEQUER'D SHELL from *Virginia*. 'Tis in figure somewhat like the femal *Tortoise* first describ'd. Saving that it is more convex, and divided into *Area's* also somewhat convex, and with transvers Furrows or Notches. 'Tis also near the Tail, turned up outward; but the hindermost part bended inward.

Another Shell of the same *Species*.

Another, like the first describ'd, excepting also, That it is more convex; and instead of specks, hath long streaks, and great blotches.

A SCALY TORTOISE SHELL. It seems to be of the Lutarious kind. I find it not describ'd, or figur'd. Above a foot long, ten inches broad, convex to the height of $3\frac{1}{2}$. The convex, all along the middle, high ridg'd. Composed of Scales, very smooth, particolour'd, of a brownish red and citrine; in the utmost edge lesser, and almost square, but with acute Angles prolonged towards the Tail, and towards the Head doubled downwards. The rest are five, six, and eight times bigger, set alternately, as the Scales in Fishes, or Slate-work upon a house. The Concave is strengthened with a Back-Bone, and eight Ribs, obliquely appendent, on each side. The Belly-piece is here wanting.

A SEA-TORTOISE. Curiously figur'd by *Besler*.

(a) Fascicul.
Rariorum.

(a) Described by *Aldrovandus* and others. He differs from the Land-*Tortoise*, chiefly, in having a more rude, and softer shell, and Feet rather like the Finns of a Fish, as proper to swim with. As also in Bulk. In the *Brasilian* shore, said to be big enough, for one sometimes to dine

(b) Mus. Ro-
man.

(c) Ibid.

four score men. (b) In the *Indian-Sea* so big, (c) that the shells serve the Natives for Boats. In the Island *Cuba* so great, that they will creep along with five men upon their

(d) Joh. de
Laet.

(d) Backs. (d) He squirts the water out at his Nostrils, in the same manner as the *Dolphin* doth at his Spout. (e) In Genera-

(e) Rondelet

(f) Trap-
ham's Disc.

of Jam. Cap.

4.

(g) Lig. Hist.

of Barbados.

whole Lunary month. (f) They take them, by turning them on their Backs with staves, in which posture they lie, till they are fetch'd away. (g) As they lie on their Backs, they will sometimes fetch deep sighs, and shed abundance

abundance of Tears. (a) They kill them, by laying them on their backs, and so ripping them up round about where the Back and Belly-pieces meet. (b) They abound in the *Caribdy* and *Lucayick* Islands, and in *Jamaica*, As also in the *Red-Sea*.

Of their Nature, Generation, and inward Parts, see some Observations in the *Philos. Transactions*. (c) The flesh hereof maketh a most pleasant jelly. (d) The *Callapee*, i. e. the Belly-part so called, baked, is an excellent Dish. (e)

The Legs, saith *Schroder* out of *Solenander*, applied to the part affected, are a most experienced Remedy in the Gout. In *Turky*, the Shells are used for Bucklers. In *Ta-brobana*, to cover their houses. (f) In *China*, (g) to make Girdles for Noble men.

A LITTLE SEA-TORTOISE, taken out of the Egg. The SHELL of a Sea-Tortoise.

The HEAD of a SEA-TORTOISE. 'Tis large, and so shews the make of the Mouth the better: where the sharp and toothed edge of the nether Chap, strikes into a Canale cut into the Bone of the upper; and the toothed protuberance of the upper, into a Canale in the nether: by which means he easily sheers the Grass, or other Plants, whereon he feeds. Given by Mr. *John Short*.

The SKULL of a SEA-TORTOISE, Nine inches long. The head of a Sea-Tortoise a foot long, is but about two inches. Therefore the Tortoise to which this skull belong'd, was a yard and half in length.

Three other SKULLS about the same bigness. One whereof, given by *Henry Whistler Esq;*

Two pieces of the SHELL of a very great TORTOISE, each with a Rib fixed in it. Given by Sir *Robert Southwell*.

The HEART of a SEA-TORTOISE. It is about as big as a Lambs. Herein both the single Ventricle, and two Auricles, are all plainly visible. The Hearts of all great Animals, saith *Aristotle*, (h) have three Ventricles; of lesser, two; of all, at least one. One would a little wonder, how so observing a man, should discover so many mistakes, in so few words.

The PISLE of a SEA-TORTOISE. 'Tis fourteen inches long, and two and $\frac{1}{2}$ round about. In substance like a Bulls. There are three more about the same bigness.

See

(a) Tra-pham, ut sup.

(b) Lig. Hist.

(c) N.27. & N.36.

(d) Tra-pham's Disc. of Jam.

(e) Ibid.

(f) Ælianus;

(g) Mus.

Rom.

(h) De Partib Anim. lib.2. c. 4.

(a) Hist. of
Barbad.
p. 118.

See the great efficacy attributed hereto by *Ligon*, (a) in curing him of two Fits of the Stone.

An EGG of a SEATORTOISE. 'Tis very white, and *Spherical*, which I find no Author distinctly to say, but only to be like the Eggs of Fowls. About the bigness of an Hand-Ball. The shell rather thinner and softer than of a Hen's. She lays them in the sand, where they lie till they are hatch'd. Sometimes above a hundred at a breed.

The CHAMÆLEON. By *Wormius* well described. *Johnston's* Figure, especially as to the feet, very false. A most curious one in *Calceolarius*. As also in *Besler*, saving that his eyes are drawn somewhat too little. Of the skin it may be noted, that 'tis every where rough, as it were, with little round blisters or knobs; on his Head and Back, greater; on his Legs, Sides and Belly, lesser; of the bigness of Silkworms Eggs. As also, that his hinder Feet are thicker than the fore-Feet: and the Heels or hinder Toes as long again, as the other; whereas in the fore-Feet, they are all of a length. The shape of his hinder Feet is therefore the better fitted to assist him in the climbing of Trees; the Heels being like strong Leavers to hoist him up. And the *make* of his Skin, for the changeableness of his Colours; which seems to depend on the falling or swelling of the said Knobs; whereby the light, receiving different Reflections, produceth different Colours. Of his Colours, saith *Scaliger*, (b) from the Observation of *Joh. Landius*, it is not so properly said, that they are chang'd, but only the several *Species* lighten'd or deepen'd. He hath a long Tail, as a *Lizard*, but slenderer: which, (c) as he descends from a Tree, he laps round about the Boughs, to keep himself from falling. His Feet also are all made where with to take fast hold.

(b) Exercit.
196. Sect. 4.

(c) Panarolus.

Of the inward Parts, see the *Philos. Trans.* N. 49. But especially *Dominicus Panarolus*, who together with his Medicinal Observations, hath published the Description and Anatomy hereof. Amongst other particulars, the Muscular Membrane of the Eye, by which singly all those motions are perform'd, which in other Animals require six, and in some seven Muscles, is remarkable. As also the distinct continuation of the Optique Nerves from their Original to each Eye; whereby the uniform or conjunct motion of both his Eyes is not necessary, as in other Creatures;

Creatures; but he is able to move one upward or backward, and the other downward or forward, or any other way, at the same time. No less the fabrick of his Tongue; which being hollow from end to end, with a string running through the hollow, fasten'd behind to the *Os hyoides*, before to its extremity, it darts out and contracts it self in an instant: and with a Viscous substance at the end, catches the Prey, which are Flies and other Insects, as we use to do Birds with Limetwigs. Thus far *Panarolus*.

In the *High-hoe*, and other Birds of this kind, there is a peculiar *Cystis*, wherein a Viscous matter, like that above mention'd, is stored, and a Pipe deriving it thence into the Mouth; the Description whereof I may hereafter publish. I suppose therefore, that upon further examination, the like Contrivance will be found in a *Chamæleon*.

It may be noted, That *Panarolus*, about the beginning of his Description, calls the *Chamæleon* a slow Creature: Yet saith afterwards, (towards the end) that he climbs Trees so wonderfully swift, as if he flew. He is not therefore so properly slow, as perhaps sullen and humerous.

Bartholine (a) hath also the Anatomy of this Animal, but transcribes it all out of *Panarolus*. In one particular much forgets himself, saying about the beginning of his Discourse, that the *Chamæleon* hath very great Lungs; and in the end, that they are but little.

(a) Hist.
Cent. 2.

A young brown CHAMÆLEON.

A third, with black, yellow, and ash-colour mixed together.

A CROCODILE, about two yards and $\frac{1}{2}$ long. He differs not much from a *Lizard*; chiefly in his Bulk, and the hardness of his Skin, which on his Back hath Scales proportionably hard and thick. In *Paname* there are some an hundred feet long; as is affirmed both by *Joh. de Lopez*, (b) and *Joh. de Leri*. (c) In the *Musæum Romanum*, there is a Tragical Relation of a very great one that devoured a Virgin, *Cap. 6*. The same Animal which in the Book of *Job* is called the *Leviathan*, and hath been commonly taken to be the *Whale*; but falsely, as *Bochart* hath demonstrated. He is tolerably well described by most; and curiously figur'd by *Besler*. He breeds in divers places in both the *Indies*, as well as in *Egypt*.

(b) Hist. Ind.
l. 6. c. 1.
(c) Cap. 10.

Nature, saith *Aristotle*, hath denied a Tongue to this Animal. Which *Sir Thomas Brown* takes notice of as a Vulgar Error. On the hinder half of his Tail he hath firm leathern upright Finns, wherewith he governs himself, as a Fish, in swimming.

(a) *Gulielmus Pifo.*

He is esteemed good meat, not only by the Natives in *Brasile*, but also by the *Hollanders* there. (a) He is taken thus; They fasten a thick long Rope to some Tree by the Water-side, and to the other end, a strong iron Hook, which they bait with a Weather. (b)

(b) *Scal. Exer. 196. Sect. 5.*

In *Brasile*, they hunt them much for the sake of their Fat, which they commonly and successively apply to their

(c) *Gul. Pifo.*

Wounds, when bitten by him. (c) As also for his *Testicles*, which smell like Oyntment, and which they sell very dear.

(d) *Ibid.*

(d) In *New Spain*, the Kernels under their Throat, smell like Musk, and are a present Remedy against burning Fevers. (e)

(e) *Joh. de Laet. l. 5. c. 4. out of Franc. Ximenex.*

The Stomach dry'd in the Sun, powder'd, and taken to the quantity of ʒi, is an admirable *Diuretick*, and brings away Stones from the Reins and Bladder. (f) The same

(f) *Ibid.*

taken to the quantity of a spoonful in the Morning, after Dinner, and before Supper, or as often as the Patient can bear it, is an excellent Remedy for the Dropsie. (g)

(g) *Ibid.*

A CROCODILE, which, with part of the Tail that is broken off, is about a yard long. Perhaps that lesser sort which breeds in *Brasile*, whereof *Linschoten* saith, That they will come into the Houses, and let the Children play with them harmlessly.

Another young CROCODILE not a foot long.

The SKELETON of a CROCODILE. Given by *Sir Robert Southwell*; to whom it was sent from the *East-Indies*. 'Tis about four yards and three quarters long. The Head about two feet. The Neck, from the hinder part of the Head, almost a foot and $\frac{1}{2}$. The Trunk, from the fore-Ribs to the Tail, four feet. The Tail, seven. From the top of the Back to the Breast, a foot and $\frac{1}{2}$ high.

The *Orbites* of the Eyes proportionably little; what ever *Pifo* saith of his great Eyes.

The Articulations of the lower Jaw with the upper; and of the *Occiput* with the foremost *Vertebra* of the Neck; are here both made in the same manner, as in other *Quadrupeds*

peds: notwithstanding the Tradition of his moving the upper Jaw.

The Teeth are about threescore, thirty in each Jaw. All of them *Claviculares*, or Peg-Teeth, not much unlike the Tusks of a Mastiff; and scarce bigger: notwithstanding that *Aristotle* calls them great Teeth, ὀδόντας μεγάλους. (a) (a) Hist. An. l. 2. c. 10. And yet, whereas a Dog hath but four Tusks, or exerted Teeth, in this Animal being all of that figure, their smallness, with respect to so great a Head, is fully compensated by their number. For the most part, those that are new and not worn, are toothed, like a small Saw, on their sides.

The *Vertebræ*, in all, sixty. Those of the Neck, are seven, as in a Man. The first whereof, in a Man called the *Atlas*, hath a *Processus* in the figure of the *Epiglottis*. The other six, have each one *Processus* or *Prominent Part*, which is long, broad, sharp, and upright: and two that are transverse, and short; to which are joyned, by a *Cartilage*, so many *Ossa mucronata*, one shorter than another from the Head toward the Trunk. But the *Vertebræ*, one lesser than another, from the Trunk towards the Head.

The *Vertebræ* of the Back, nineteen; that is, three sevens running one into another. Each of which hath three *Prominent Parts*, which are sharp, broad, and long; one perpendicular, and two that are transverse, or at right angles.

The Ribs 24, twelve on each side. Seven of which, have each of them double *Cartilages*, that is, one after another, appendent to them.

The fore part of the *Sternum* is plainly bony. The hinder part, cartilaginous; shaped like the *Os Hyoides* in a Man.

The *Vertebræ* of the Tail, are 34; or (if you add the last of the Trunk as common to both) 35; that is seven times seven. The first fourteen, have each three *Prominent Parts*, like those of the *Vertebræ* in the Back. The next nineteen, have only an upright *Processus*. The last of all, hath none. The first 14, are double, in number to those of the Neck, the next 19, are equal to those of the Back; the last answers to the Head. To all the *Vertebræ* of the Tail, except the last, are also subjoyned so many

Offa Mucronata, directly opposite to the upright *Processus*.

The Shoulder-Blades are two on each side; each $\frac{1}{2}$ foot long.

The Bones of the fore-Foot, 27. The Thigh-Bone near a foot long; an inch and $\frac{1}{4}$ over. The Leg-Bones, two; each a little above $\frac{1}{2}$ a foot long; and of equal thickness, *sc.* about $\frac{1}{4}$ of an inch over. The Foot strictly so call'd, the length of the Thigh. The Bones of the *Pedium*, four. The Fingers or Toes, five. The inmost, the thickest, like a Thumb. From thence, the third, the longest. The Bones of the Thumb, three; of the next Finger, four; of the next, five; of the two outmost, four; in all 20. All armed with black Claws, a little crooked, and not much above an inch long.

The Hip-Bones are three; each of them $\frac{1}{2}$ a foot long.

The Bones of the hinder Foot, 24. The Thigh-Bone above a foot long, and an inch and $\frac{1}{2}$ over. The Leg Bones almost eight inches long. The inmost, above an inch over; the other, but $\frac{1}{2}$ an inch. The Foot, so called, the length of the Thigh. The Bones of the *Pedium*, four. The Toes, four; whereof the inmost, the greatest; the third, the longest. The Bones of the great Toe, three; of the next, four; of the third and fourth, five. The Claws somewhat bigger than in the fore-Foot.

Amongst other things worthy of note, the senselessness of the tradition of the *Crocodiles* moving his upper Jaw, is plain from the structure of the Bones, that is, the Articulation only of the *Occiput* with the Neck, and of the nether Jaw with the upper, as above said.

(a) Lib. de
Aquatil.

The first Author of it was *Aristotle*, in his Fourth Book *de Partibus Animalium*, Cap. 11. And thus much is true, not only of this Creature, but of all others, which have a long Head, and a wide *Rictus*, that when they open their Mouths, they seem to move both Jaws; as both the *Viper*, and the *Lizard*. And for the same reason, *Columna* (a) might say as much of the *Hippopotamus*, that he moves the upper Jaw, as the *Crocodile*. So all Birds, especially with long Bills, shew the contemporary motion of both the *Mandibulae*; the *Musculi splenii* pulling back the *Occiput*, and so a little raising the upper, while the *Musculi Digastrici* pull the

the other down. But that this motion was not meant by *Aristotle*, appears in his First Book *de Hist. Anim*, c. 11. & lib. 3. c. 7. where he saith more plainly, That of all other Animals, only the *Crocodile* moveth the upper Jaw. So that he speaks of it, as a motion strange and peculiar; as if the upper Mandible did make an *Articulation* with the *Cranium*: contrary to what is here seen. And if we will hear *Piso*, who probably speaks *Aristotle's* meaning, as plainly as he doth his own, he goes further, and saith, (a) That the *Crocodile* doth not only move his upper Jaw, but that his nether Jaw is immoveable. Than which *Af-* ^{(a) Hist. N. lib. 5.} f-
 fertion, to one that hath any competent knowledge in Anatomy, and seeth the Head and lower Jaw of this Animal articulated in the same way, as in other Animals, nothing can appear more ridiculous.

The WINDPIPE of a CROCODILE. It is almost an inch and $\frac{1}{2}$ over. Composed of *Cartilaginous* Rings, not broken off, with a Membrane betwixt their ends, as in most *Quadrupedes*, but entire.

The GREEN LIZARD. It was brought from the *West-Indies*. See the Description hereof in *Gesner*, and others.

The SENEMBI, a Lizard so called in *Brasile*. Also called *Igvana*. Curiously figur'd by *Besler*. Well describ'd by *Marggravius*, and after him, *Wormius*. Saving as to the odd structure of the hinder Foot. The inmost Toe is joyned to the next, by a Membrane, for the length of an inch and $\frac{1}{2}$. This to the third, by a like Membrane for the length of an inch. This again to the fourth, for the length of an inch and $\frac{1}{2}$. The fourth, almost loose from the last. The Picture also, commonly given, falsly represents the fore-Leg equal to the hinder, which is far longer and thicker.

Another SENEMBI lesser than the former.

The SWIFT, or SPOTTED LIZARD. Commonly called STELLIO, or the STARRY-LIZARD; but not properly, the Stars, in the Figure given by *Aldrovandus* and others, being feigned. For the Animal is not marked with Starry, but with round Spots. The lesser are sprinkled up and down. The greater composed into about 13 half Rings or Girdles. On the Back the spots
 are

are also more distinct, than on the Tail. They breed in *Thracia*, *Syria*, and *Sicily*. The Powder hereof being taken, is believed by some *plurimum stimulare Venerem*.

The SWAPTAIL LIZARD. *Uromastix, vel Caudo-verbera*. Called also CORDILUS. In *Calceolarius's Musæum* there is a curious Picture hereof, under the Name of CROCODILUS TERRESTRIS. As also in *Besler. Gesner*, from *Thomas Erastus*, hath very copiously describ'd him, especially his Tail.

The BUGELUGEY. Of kin to the former. *Aldrovandus* and *Johnston* give only his Figure, with the Name of *Lacertus Indicus*. He is distinguished from other *Lizards*, chiefly, by the Scales on his Belly, which, like those of a *Crocodile*, are very great; *sc.* five or six times bigger than those on his back. It was brought from *Africa*. This *Lizard*, saith *Wormius*, moveth his upper Jaw, as the *Crocodile*. Which, in what sense it is false and absurd, I have above shew'd.

The SCALY-LIZARD. He is well pictur'd in *Besler*. As also in the *Musæum* of *Olearius*. *Aldrovandus* gives only a rude half draught, and without any Description, as well as the former. *Clusius* only saith, He remembers that he had seen one of them. *Bontius* (a) hath his Picture, but a very bad one. Elsewhere I find it not. He hath also described him, but very defectively, and with several mistakes.

(a) Hist. N.
l. 5. c. 8.

He is a yard and $\frac{1}{2}$ long. His Head from his Nose-end to his fore-Feet not above three inches. He hath no Neck. His Trunk, from the fore-Legs to the hinder, not above ten inches and $\frac{1}{2}$. His Tail exceeding long, *sc.* a yard and half a quarter. His Head above two inches over. His Nose near an Inch. His Trunk almost four. His Tail moderately taper'd, and ending obtusely. The under part of the Tail is plain or flat; the upper part, hyperbolick. His fore-Legs, contrary to what they are in other *Lizards*, are longer than the hinder; these, not above three inches and $\frac{1}{2}$; those, above four. The Claws also of the fore-Feet are longer; the longest about an inch; those of the hinder, but $\frac{1}{2}$ an inch. He hath only four Toes and a Heel, both before and behind.

He is all over, except his Throat, Belly, the lower part of

of his fore-Leg, and the inward part of his hinder, cover'd with Scales, very thick, and in hardness answering to the most solid Bone. The basis of each Scale (perhaps through age) of a blackish yellow, the Cone betwixt yellow and straw-colour, or like old *Ivory*. Adorned with *Striæ* proceeding from the base to the Cone. Set together, with an alternate respect, as the Scales of Fishes. In the Trunk, there are 10 or 11 filed to each Rank. Towards the end of the Tail, but five. The greatest, near two inches broad; the least, a quarter of an inch. On his Forehead, Back, and fore part of his Tail, they are flat. But on the edges of the Tail, they are doubled into an acute Angle, the one half of each standing on the Convex, the other on the flat of the Tail.

He is said to be a most tame and innocent Creature. Which is very likely; according to the way of Nature, which usually leaveth dangerous Animals, as *Serpents*, and other hurtful *Lizards*, naked: but defendeth the Bodies of fearful and innocent Creatures, as the *Tortoise*, the *Tatu*, and the like, with Armor.

Johannes Lerus, quoted by *Linschoten*, mentions a white scaly *Lizard* in *Brasile*, as thick as a Mans middle, and five or six feet long. Perhaps a bigger of the same kind with this above described.

There is a sort of little *Lizard*, (a) which when he swelleth with anger, like the *Chamæleon*, changeth his colour, from green to a kind of Hair-colour or Ruffet. The Eggs of some, if not of most *Lizards*, eat very pleasantly. And in (b) *Brasile* there are a sort of *Water-Lizards* five feet long, which being flay'd and sodden, for whiteness, sweetness, and tenderness, surpass all other meats.

A LAND-SALAMANDER. Described by *Aldrovandus*, and others. Much like a *Lizard*; but his Mouth is shorter, and broader, more like a *Toads*: and seldom exceedeth a foot in length.

Bartholine tells of one that was kept alive in a Glass nine Months without food. (c)

The LITTLE COMMON EFT. He hath a thicker Trunk, a blunt Oval Snout, his hinder feet are very distant from the foremost.

The SLENDER EFT. His Head is rateably very great;

(a) Ligon's
Hist. of Bar-
bad. p. 62.

(b) Linschot.
Lib. 2. 248.

(c) Hist. 50.
Cent. 2.

great ; his Snout also longer and sharper than in the former. His Trunk slenderer and much less belly'd. His hinder Legs also stand nearer to the foremost.

The THICK-TAIL'D EFT. His Head is here wanting. His Tail is not so slender or tapering as in both the former, but ends more obtusely. And his hinder feet stand yet nearer to his foremost.

The SCINK. Described by *Wormius*, and others. Curiously pictur'd by *Besler*. Like a *Lizard*; saving that he hath a shorter Neck and Tail, short Legs, a flat and broad Foot like a Hand, with very short Toes, and without any Claws. The Powder hereof is said, *Potenter Veneremur stimulare*.

S E C T. III.

O F S E R P E N T S.

A SNAKE preserved in Spirit of Wine. In *Barbados* there are some about a yard and half long, that (a) will slide up the perpendicular Wall of a House out of one Room into another. A greater agility without feet, than we see in most Creatures that have four. Much helped, as it should seem, by their great length; whereby they can, in an instant, reduce themselves into so many more undulations for their better ascent. In *Brasile*, saith *Joh. de Laet*, (b) there are Snakes found sometimes 25 or 30 feet long. The *Indians*, in some places, eat Snakes very greedily.

(a) Ligon's
Hist. of Bar-
bad. p. 61.

(b) Lib. 15.
c. 14.

The greater SLOW-WORM; *Cæcilia*. Called also the BLIND-WORM; so commonly thought to be, because of the littleness of his Eyes. His Skin also is very smooth and glistering. His Teeth very small. Of a lighter colour than the Adder; which are his principal Notes. See the Descriptions of *Gesner* and *Aldrovandus*. The Female is Viviparous, as well as the Viper. *Bellonius* saith, that out of one, he hath taken above forty young ones.

The VIPER. *Vipera*, qu. *Vivipera*; because she only among Serpents hath been thought to bring forth her young

young Ones. All Animals, saith *Aristotle*, (a) that bring forth their young, have also external Ears: yet knew that an Adder which hath no *Auricle* is Viviparous. And this, indeed, he observes with a good Remark, which is, That she first lays her Eggs within her Womb; (b) wherein they are afterwards hatched. Which had been a fair Introduction to him, to have observed, That all other Viviparous Animals are Oviparous within themselves. And 'tis much, that the hint hath not been long since taken from the *Raya*, and some other Fishes. The Viper, saith Sir *Thomas* (c) *Brown*, from the experience of credible Persons, in case of fear, receiveth her young Ones into her Mouth; which being over, they return thence again.

The chief use of Vipers is for the Medicine called *Theriaca Andromachi*. But there are also divers Medicines made out of them: as

<i>Oleum per Infusionem,</i>	<i>Sal Viperarum</i>	<i>Spiritus,</i>	
<i>Oleum Stillatitium,</i>	<i>Volatile,</i>	<i>Essentia,</i>	
<i>Vinum Viperinum,</i>	<i>Fixum,</i>	<i>Alcohol Burgravii,</i>	(d) Schrod.
	<i>Theriacle,</i>	<i>Pulvis Viperæ Germanus.</i>	(e) Prævo-
			tius.

Of the nature of the Viper, see the Observations of *Bourdelot*, *Redi*, & *Charas*. See also the *Phil. Trans.* N. 87.

The SLOUGH of an ENGLISH VIPER. That is, the *Cuticula*. They cast it off twice every year, sc. at Spring and Fall. The separation begins at the Head; and is finish'd in the space of 24 hours. From all parts so entire, that the very *Tunica Adnata*, or outward Skin of the Eye it self is here plainly to be seen.

A Gelly made hereof, is order'd to be used for the making up of the compounded Powder of Crabs Claws into Balls. Which way of preservation, were no less proper for divers other Cordial Powders; especially such as are *Aromatick*, and whose Virtue lies in parts that are of themselves volatile and easily evaporable. Of which kind, there are none in this Powder.

The SKIN of a BOIGUACU; a Serpent so called, by the Natives of *Brasile*. As far as can now be seen, 'tis mixed of ash-colour with cancellated work of brown;

H

some-

somewhat after the manner, as in divers other *Indian* Serpents. Towards the Head it is somewhat slenderer, than about the middle; where it is in compass, half a yard. 'Tis almost seven yards long. See the Description of the Serpent in *Piso*. He is of all other kinds the greatest. But not so venomous, as are many others. *I have now at home, faith Bontius, the Skin of a Serpent (of this kind) twelve yards long, which I kill'd in a Wood in Java. And, that in that Kindgom, was one taken thirteen yards and 1/2 long, with a Boar in her Belly; of which, being boyl'd,*

(a) Hist. Nat.
l. 5. c. 3.
(b) Lib. 14.
c. 1.

the general *D. Petrus*, and others did eat a part. (a) And *Joh. de Laet*. reports, (b) That in *Rio de la Plata*, a Province of the *West-Indies*, there are some *quatuor Orgyas longi*, and so big, as to swallow a Stag whole, horns and all. Of such kind of Serpents, see also *Marcus Paulus Venetus*, and *Athan. Kircher*. (c)

(c) China
Illustrata.

This Serpent, says *Piso*, will thrust his Tail up a Mans Fundament, and gird him about the middle till he kills him. (d) Yet is it probable, that they communicate no Venime by their Tail, but only are so cunning as to use that way, whereby to take the faster hold. Not only the Natives, but the *Hollanders* that live amongst them, make them part of their food. (e)

(e) Ibid.

The SKIN of the *IBIBABOCA*. Another Serpent of *Brasile*, so called by the people there. 'Tis a foot round about, and almost three yards and half long. His

(f) Joh. de
Laet. from J.
Lerius.

(g) Ibid.

(h) Piso.

colours, originally, are white, black, and red. (f) Of all the kinds of Serpents, his Bite is the most pernicious, yet worketh the slowest. (g) 'Tis healed by a *Cataplasme* made of the Head of the Serpent. (h)

Two SKINS of the same kind, about eight feet long; and with their colours elegantly chequer'd, as in the former.

The SKIN of a *RATTLE-SNAKE*; a Serpent so called, from the Rattle at the end of his Tail. By the Natives of *Brasile*, *BOICININGA*. Well described by *Franciscus Ximenez*; and from him by *Joh. de Laet*. But his Rattle is no where well pictur'd. Neither doth *Ximenez*, or any other Author observe the true structure of it.

It is composed of about 8, 10, or 12, some times, as this

this before us, of sixteen white Bones, but very hollow, thin, hard, and dry, and therefore brittle, almost like Glafs, and very sonorous. They are also all very near of the same bulk; and of the self same Figure, almost like the *Os Sacrum* in a Man. For although the last of all only, seems to have a kind of a Ridged Tail or *Epiphysis* adjoyned to it, yet have every one of them the like; so, as the Tail of every uppermost Bone, runs within two of the Bones below it. By which *Artifice*, they have not only a moveable coherence, but also make a more multiplied sound, each Bone hitting against two others at the same time.

By this Rattle, those that travel through the Fields, or along the High-ways, are warned to avoid coming near so noxious a Creature. For those that are bitten with him, sometimes die miserably in 24 hours; their whole body cleaving into chops. (a) They commonly bury the Limb that is bitten, and so keep it, till the pain wears off. (b) By thrusting the end of his Tail, saith *Piso*, up into a Mans Fundament, he kills him immediately. But he seems here falsely to attribute that to this Serpent, which he doth much more probably to the *B O I G U A C U*. For this is but a lesser sort, seldom exceeding a yard and $\frac{1}{4}$, and therefore cannot do it by girding a Man about. And for there being any Venime in the Rattle, it was, I believe, hardly ever imagin'd by any other man. Their progressive motion, saith *Joh. Lerus*, is so swift, that they seem to fly. Which makes the Rattle to be so much the more useful, in giving timely notice of their approach. Some of the largest are in *Panuco*, a Province of *Mexico*. 'Tis said, that the smell of *Dittany* kills him. (c)

It is affirmed by *Marggravius* and others, that as many years old as the Serpent is, the Rattle hath so many joynts. Which if it be true, then they will live at least sixteen years, some Rattles (as this here) consisting of sixteen joynts. Which makes the Tradition very suspicious.

About fourteen more *S K I N S* of the *R A T T L E S N A K E*. Some of them are all over of a dark-brown. Others chequer'd with a brown, upon ash-colour.

Several *R A T T L E S* of the same Serpent; most of them composed of above ten joynts.

A *P O W D E R* said to be taken out of a Serpents
H 2 Head.

(a) Francis
Ximenez
quoted by
Joh. de Laet:
l. 5. c. 15.
(b) Bontius:

(c) See the
Phil. Transf.
N.3. & N.4.

Head. 'Tis as white as Starch, and tasteless. Makes a noise between the Teeth, like that Mineral called *Agaricus Mineralis*. Acid, and especially Nitrous Spirits dropped upon it, produceth a considerable effervescence.

The SERPENT-STONE. Said by some, to be factitious, By others, to be a Natural Animal Stone. Particularly by Sir *Philiberto Vernatti*, an observing Person, to be taken out of the Head of a Serpent in *Java*, from whence it was sent by him hither. It seems to be that called *Bulgolda*, which *Boetius*, out of *Ferdinando Lopez*, saies is taken out of the Head of an Animal, which the *Indians* call *Bulgoldalf*. Whether it be natural or artificial, I shall here describe it.

'Tis about $\frac{3}{4}$ of an inch long, above $\frac{1}{2}$ over, and $\frac{1}{4}$ thick; flat and almost orbicular, like a Cowslip-Cake, or other like Confection. All round about very smooth, and shining, for the greater part, black; but with some ash-colour intermixed; so as to look like a River-pebble. But of a substance soft and friable, like the Oriental *Bezoar*. And in like manner, as the same Stone, is easily dissolved with any Nitrous Spirit dropped upon it, but not with other Acids. Which is to me an argument that it grows within some Animal: it being the nature of most Animal-Stones, to be dissoluble only by Nitrous Spirits.

(a) Philo-
soph. Transf.
N. 6.

Sir *Philiberto* (a) amongst other passages of this Stone; saith, That if it be laid to a Wound, made by any Venimous Creature, it is said to stick to it, and so to draw away all the Venime. And the like I have heard affirmed of the same Stone by a Physitian of Note in this City.

SECT. IV.

OF BIRDS.

CHAP. I.

Of Land-Fowls, and of their Parts.

A Great BAT or FLITTER-MOUSE of the WEST-INDIES. *Vespertilio Americ.* The Bat stands in the Rear of Beasts, and in the Front of Birds. I meet with no full Description of this kind. From his Nose-end to his *Anus* almost a foot. His Body almost three inches over. His Head two inches and $\frac{1}{2}$ long, one and $\frac{1}{2}$ over. His Nose like a Dogs, the end about $\frac{1}{2}$ inch broad. His Ears extream thin, about $\frac{3}{4}$ of an inch long, and as broad; an inch and $\frac{1}{2}$ asunder. His Eyes $\frac{1}{2}$ of an inch long. He hath six and thirty Teeth. In each Chap before, are four little ones, roundish, blunt, and almost flat-ended; rather *Tunfores*, than *Incisfores*. The next are large, shaped like the Tusks of a Dog, two in each Chap. Next to these, two more of the first kind in each Chap. And last of all twenty Grinders.

The Wings stretched out, are two or three inches above a yard wide from end to end. The upper part of the Arm that governs them, about four inches long, and fleshy, *sc.* an inch over. The next, or the *Cubitus* also four inches long, tendinous, and slender, not above $\frac{1}{4}$ of an inch thick. The Fingers are five, or four and a Thumb. Each hath three Bones. The first Bone of the fore-Finger or Thumb, is above $\frac{1}{2}$ an inch long; the middlemost, an inch and $\frac{1}{2}$; the last very short, sheathed within a sharp and crooked Claw, $\frac{3}{4}$ of an inch long, almost like that of a Hawk. The first Bone of the next Finger, is above three inches long; the middlemost, but $\frac{3}{4}$ of an inch; the last, about $\frac{1}{2}$ an inch; having a very little Claw. The first Bone of the third or middle Finger, is four inches long; the middlemost,

most, three; the last, three and $\frac{1}{2}$. The first of the fourth, is also four inches long; the middlemost, two and $\frac{1}{2}$; the last, as much. The first of the fifth or utmost Finger, is also four inches long; the middlemost, two; the last, as many.

His Thigh an inch and $\frac{1}{2}$ long, and fleshy, yet not much above $\frac{1}{2}$ inch over. His Leg two inches long, tendinous, and about $\frac{1}{4}$ of an inch thick. The *Pedium*, above $\frac{1}{2}$ inch long. The Toes, five; each of them about an inch and $\frac{1}{2}$ long; and each having a Claw, like that on his Thumb. The two inmost, have each two Bones; the other have three.

The Membrane which makes the Wings, excepting only his Head, Neck, two joynts of his Thumb and the bottom of his Feet, is spread from the top of his Back, over all his Parts.

He hath no Tail.

The shape and number of his Teeth, shew him to be a Voracious Creature. The Claws of his Thumb and Feet, that he is also Rapacious. The structure of his Wings is admirable. For were they to be always stretched out, they were (as to the length of the Bones) the most irregular and ill contrived of any thing that ever was seen. But being made to open and shut, shew the greater *Artifice*, in having the Bones of such a length, as might serve for all the Positions betwixt being quite open and quite close. The particular explication whereof, notwithstanding, cannot be made, without examining the several Muscles, by which all the said positions are determin'd.

Another WEST-INDIAN BAT of the same kind. There are many of them in *Brasile*. The *Chineses* esteem of them as a delicate sort of meat. (a) *Barlaeus* mentions a Water-Bat, which the Natives of *Brasile* call *Guacucua*. (b) In the same Island, there is a sort of great Bat, that as Men lie asleep with their Legs naked, will suck their blood at a Wound so gently made, as not to awake them: whereby they are oftentimes in danger of bleeding to death. (c)

(a) Kirch.
Chin. Illustr.

(b) Res Bra-
sil. p. 224.

(c) Piso's
Hist. N.

The HEAD of an OSTRICH. *Caput Struthio-cameli*. He is accurately described in Mr. Willughby's *Ornithologia*. His Head, like that of a Goose; he hath great

great thick black Hairs on his upper Eye-lid, as in *Quadrupedes*; his Tail standing in a Bunch, and not expanded, as in other Birds; his Wings very short and little; and his Foot not divided into three or four Toes, as in other Birds, but into two only; which are his principal Characters.

The *Ostrich* is the greatest of Birds; when he holds up his Head and Neck, near two Ells high. (a) In the Kingdom of *Abasia*, they are as big as Asses. (b) The *American*, are lesser than those of *Africa*. (c)

He flies not, because his Wings are short. But with their help, is able to out-run a Horse. (d) He is a gregarious Bird. His Feathers are made use of for the adorning of Hats, Caps, &c. for making of Womens Fans, and the like. (e) The Stomach of an *Ostrich*, saith *Schroder*, taken in power, wonderfully dissolves the Stone. (f) 'Tis probable it may bring away Gravel.

The Leg of an OSTRICH. 'Tis near half a yard long without the Foot. The Foot, no less than ten inches, as long as of most men. The Leg-Bone in the smallest part four inches about, and in the Joynt nine inches: which is thicker than in most men. It hath but one triangular Claw; of that substance, as to look liker a little Hoof, and seems rather harder than that of a Horse.

The CASSOWARY. *Emen.* Accurately described by *Clusius*, and pictur'd in *Willughby's Ornithologia*. His Bill, almost like that of a Gooses, but not so broad. Next to the *Ostrich*, he is the greatest of Birds; and in Bulk little inferior, but not near so tall. On the top of his Head, hath a horny Crown, which falls off when he moults, and grows again with the Feathers. His Wings extream small. The plumage of his Feathers so little, that he seems at a distance to be hairy. Hath three Toes without a Heel, as the *Bustard*. Hath no Tail: which are his chief Marques. He is brought from *Tabrobana*, the *Molucca* Islands, and others of the *East-Indies*.

The HEAD of a CASSOWARY. The Bill is longer, but not so broad, and so the mouth not so wide, as of an *Ostrich*.

The LEG of a CASSOWARY. 'Tis almost as long, and as thick, as that of an *Ostrich*.

The

The HEAD of the SEA-EAGLE or OSPREY.
Caput Haljaëti.

The CLAWS of the same BIRD. See the full Description of the Bird in *Willughby's Ornithologia*.

(a) Willugh. Ornithol.
(b) Ibid. The Eagle breeds abundantly on the Mountains *Taurus* and *Caucasus*. Not only comes into *England*, (a) but is said to build yearly on the Rocks of *Snowdon* in *North-Wales*. In (b) the Year 1668. on the *Peke* in *Darbyshire*, was found an *Eagles* Nest, flat or level, and about two Ells square; together with a young one in it.

The BIRD of PARADISE. By the Natives of the *Molucca* Islands (where they breed, and by whom they are worshipped,) called *MANUCODIATA*, i. e. The Bird of God. Because they know not from whence they come; and for their beauty. From his swift flight to and again, the *Indians*, in their Language, call him a Swallow. *Marggravius* reckons up several sorts of them, and describes them all. The least kind, *Clusius* calls the King. Because (as he saith, from the report of the *Dutch* Mariners) as they fly together, about 30 or 40 in a flock, he always keeps higher than the rest.) Besides the smallness of his Body, in respect to what his copious Plumes shew him; the long Feathers which grow upon his sides under his Wings, and are extended thence a great way beyond his Tail; and the two long Strings or Quills which grow upon his Rump, do most remarkably distinguish him from all other Birds. He is elegantly figur'd in *Calceolarius's Musæum*, with the Title of *Chamæleon aereus*.

(c) Clusius. *Antonius Pigafeta* was the first that brought this Bird, or any certain knowledge of him into *Europe*. (c) Before which, he was believed, not only by the Vulgar, but by Naturalists, (amongst whom *Scaliger* (d) was one) that they had no Legs, but always flew up and down suspended in the Air, by the help of their Wings and Tail spread all abroad. According to which silly fancy, he is also pictur'd in *Gesner*.

(d) See Exerc. 228. S. 2.

Agreeable to this conceit, it is likewise commonly thought, and by *Georgius de sepibus*, who describes the *Musæum Romanum*, is affirmed, that those two long Quills that grow upon the top of this Birds Rump, being at his pleasure twined or wrapped round about the boughs of Trees,

Trees, serve quietly to suspend him. Whereas, as Mr. *Wray* hath also rightly observed, (a) not being Muscular, it is impossible they should be of any such use. His hooked Claws shew him to be a Bird of Prey; and he ordinarily flies at *Green-Finches*, and other little Birds, and feeds on them. (b) The *Tarnacenses* shoot them down with Darts. (c)

(a) Willoughb. Ornith.

(b) Bont. H. N. I. 5.

(c) Ibid.

Two more MANUCODIATA'S of the same Species.

The GREAT RED and BLEW PARROT. *Psittacus Erythrocyaneus*. All the great kind called also MACCAW and Cockatoone. It was sent hither from Java. See his Description in Willoughby's *Ornithologia*. There are of these greater, the middlemost called *Popinjays*, and the lesser called *Perroqueets*, in all above twenty sorts. Their more remarkable Parts, are their hooked Bills, whereby they catch hold of Boughs, and help to raise themselves up in the climbing of Trees. Their broad, thick, and muscular Tongues, for which they are called ἀνθρωπόγλωττοι, and by which they are the better enabled to speak, and to rowl their meat from side to side under the edges of their Bills: and their Feet, which, like those of the *Woodpecker*, have two Toes before and two behind, with which they bring their meat to their mouths; and that after an odd way, sc. by turning their foot outward. (d)

(d) Willoughb. Ornith.

The Parrot only, saith *Scaliger*, (e) with the *Crocodile*, moves the upper Jaw: Yet the same is affirmed of the *Hippopotamus*, by *Columna*; of the *Lizard*, by *Wormius*; and of the *Phænicopter*, by *Cardan*. Which confirms what I have said under the Description of the *Skeleton* of a *Crocodile*, and in what sense it is absurdly said of them all. In their Cheeks, saith *Piso*, (f) in each Nostril, and on the top of their Heads, in a certain Tumor, there lies, about August, a thick Worm; all which, in a little time, fall out of their own accord, without any sign left of their ever being there. They are a gregarious sort of Birds. (g) They breed very numerously in both the *Indies*. In *Barbados*, fly in flocks like Clouds. In *Calecut* they are forced to set people to watch their Rice-Fields, lest they should spoil them. (h) The flesh of their Chickens eats just like a Pigeon. (i)

(e) Exercit. 236, S. 1.

(f) Hist. N. I. Occid.

(g) Bart. 118.

(h) Gessner out of Ludov. Romanus.

(i) Piso.

The BILL of a BIRD, by the people of *Brasile*, called COA. It is of a blackish-brown mixed with ash-colour. In shape, and bigness, very like that of the least sort of *Parret* called *Perroqueets*. He is said to feed upon all manner of venomous things : and to be himself a Cordial. Which, if true, yet is it not to be much admir'd. For if by venomous things, be meant Animals that have a venomous bite ; Do we not know that the flesh of such Animals, as of *Vipers*, is esteemed a Cordial ? Or is it understood of things that are *Tota substantiâ* Venomous, or at least malignant to humane Bodies, do not *Ducks* feed on living *Toads* ? Again, what is a Cordial ? are not many things so call'd meerly from their collateral effect ? *Carduus Benedictus* it self, and other things given as such, Nature doth certainly abhor : but being able to cast them off, by Vomit or Sweat, and so perhaps something else that offends her together with them, they are therefore called Cordials.

A young LINET which being first embowel'd, hath been preserved sound and entire, in rectified Spirit of Wine, for the space of 17 years. Given by the Honourable Mr. *Boyl*. Who, so far as I know, was the first that made trial of preserving Animals this way. An Experiment of much use. As for the preserving of all sorts of Worms, Caterpillars, and other soft Insects in their natural bulk and shape, which otherwise shrink up, so as nothing can be observed of their parts after they are dead. So also to keep the Guts, or other soft parts of Animals, fit for often repeated Inspections. And had the Kings or Physicians of *Egypt* thought on't, in my Opinion, it had been a much better way of making an everlasting Mummy.

A young CHICKEN emboweled and put into rectified Oil of Turpentine, at the same time, with the *Linnet*, and preserved sound ; Only there is a little sedement at the bottom of the Glafs.

The HEAD of the HUMGUM, or Horned-Crow ; called RHINOCEROS *avis*. It was brought from the *East Indies*. 'Tis of kin to that described by *Bontius*. Mr. *Willoughby* gives the Picture, but no Description. It hath a Crown on the top of the Bill, of the same colour and substance therewith, and prolonged in the shape of a Horn,

Horn, to the length of $\frac{3}{4}$ of a foot. Yet not bended upward, as in that of *Bontius*, but standing horizontal. It is spongy behind, and hollow before; so that it is very light, although so big. The Bird described by *Bontius*, and probably this also, breeds in *Bantam* and *Molucca*.

The nether BEAK of the RHINOCEROS Bird. If we believe, saith *Georg. de Sepibus*, (a) the Reverend Fathers, which are us'd to go to the *Indies*; the Bill of this Bird is a most precious Antidote against all manner of Poisons. For which cause also, the *Indian* Kings preserve it as a great Treasure, and account it a Royal Present. (a) Musæum Romanum

The HEAD of the CROWNED CROW Mr. *Willughby* pictures it. But I meet with the Description here of no where. 'Tis almost a foot long. The Skull not above two inches and $\frac{1}{2}$ long, above two broad, and as high. The Bill likewise as broad. The nether Beak an inch and $\frac{1}{2}$ high, one forked Bone, in the shape of the *Os Hyoides* in a Bird, hooked or bended downward, the edges indented like a Saw; but with the points of the Teeth directed forward. The upper Beak an inch and $\frac{1}{2}$ high, consisteth of one concamerated Bone, bended downwards, and Toothed as the other. To this and the Skull, grows a square horny-Crown, about six inches long, three and $\frac{1}{2}$ over, and one and $\frac{1}{2}$ high, spongy behind, and hollow before. The Nostrils, which are about $\frac{1}{4}$ of an inch wide, open between the Eye and the top of the Bill.

The Teeth of the Bill, not being made to point inward, but forward or outward, plainly shews, that they serve not; as they do in some other Birds, to hold fast the Prey; but rather, for some purpose or other, to perform the use of a Saw.

The HEAD of the TOUCAN, so called by the *Indians*. From the noise he makes, *Aracari*. (b) And *Pica Brasiliensis*, for the likeness of both their Tails. (c) In the *Musæum Romanum*, this and the *Rhinoceros Avis*, are confounded. (b) Pison (c) Willughby's Orn. They breed not only in *Brasile*, but also in *Guajana*; and other places. This Bill was sent from *Peru*. See the Description of the Bird in Mr. *Willughby's Ornithologia*. That which is most remarkable of him, is, that his Bill is almost as big as his Body, which is not much bigger than

that of a *Black-Bird*. The Bill and Head I shall describe more fully.

They are in length eight inches. The Skull but a little above an inch and $\frac{1}{2}$ square. The upper Beak, which is prominent above the Skull near $\frac{1}{2}$ an inch, is almost two inches high, and an inch and $\frac{1}{2}$ over; consisting of one not hollow, but very spongy Bone, as the Crown of the *Indian Crow*, or rather more; with a ridge all along the top, which is blunt behind, and very sharp before; the end or point hooked down like that of an *Eagle*; and both the edges Toothed, as in the *Indian Crow*. The nether Beak near an inch and $\frac{1}{2}$ over, one and $\frac{1}{4}$ high, hollowed, ridged underneath, and Toothed as the upper.

The Nostrils stand strangely, in a place altogether unusual, *sc.* on the top of the Head, behind the top of the Bill. The Teeth serve, doubtless, for the same purpose, as in the *Humgum*, and the *Indian Crow*.

(a) Lib. 3.
Sect. 2.

Within his Bill, saith *Piso*, (a) in the place of the Tongue, is contained a moveable Feather or black Quill. Were it really such, it were most absurd to think it any other, than one there by chance. But if a Tongue, or natural Part, it might have some such odd figure, as to have some resemblance to the stump of a Feather.

The BILL of the FLEMING of *Suranam*. Very like to that of a *Toucan*, saying, that it is not so sharp-ridged; neither is it spongy within, but perfectly hollow. So that the Bird seems to be an other *Species* of the *Toucan* kind.

The LEG of a DODO. Called *Cygnus Cucullatus*, by *Nierembergius*; by *Clusius*, *Gallus Gallinaceus Peregrinus*; by *Bontius* called *Dronte*; who saith, That by some it is called (in Dutch) *Dod-aers*. Largely described in Mr. *Willughby's Ornithol.* out of *Clusius* and others. He is more especially distinguished from other Birds by the Membranous Hood on his Head, the greatness and strength of his Bill, the littleness of his Wings, his bunchy Tail, and the shortness of his Legs. Abating his Head and Legs, he seems to be much like an *Ostrich*; to which also he comes near, as to the bigness of his Body. He breeds in *Mauris's* Island. The Leg here preserved is cover'd with

with a reddish yellow Scale. Not much above four inches long; yet above five in thickness, or round about the Joynts: wherein, though it be inferior to that of an *Ostrich* or a *Cassioary*, yet joyned with its shortness, may render it of almost equal strength.

The LEG, as it seems, of a certain MONSTROUS BIRD. 'Tis half a foot long. Two inches and $\frac{1}{4}$ about. Hath five Toes. The second from the inmost, the longest. The fourth, the shortest. The fifth or utmost the thickest. It hath a very great black Spur, yet not crooked as a *Cocks*, but strait, and sharp-pointed, two inches long; and next the Leg an inch and $\frac{1}{4}$ about.

A KING-FISHER, *Ispida*. Described by Mr. Willughby and others.

Two HEADS of the GROSSBEAK called *Coccothraustes*: See the Description of the Bird in Mr. Willughby's *Ornith.* There is a most curious Picture hereof in Dr. Charlton's *Onomasticon Zoic.* They breed in *Germany* and *Italy*: but rarely, and not except in Winter, seen in *England*. They will crack Cherry-stones, and Olive-stones too (which are as hard again) very easily; (a) his Bill and Temporal Muscles are so strong.

(a) Willughby. Ornith.

The HUMING BIRD. By the *Brasilians*, called *Guanumbi*. By *Clusius*, *Ourissia*, i. e. a Sun-beam; because of his radiant-colours. By the *Spaniards*, *Tomineius*; because (b) one of them with its Nest, weighs but two *Tomino's*, a weight so called by the *Spaniards*, consisting of 12 Grains. *Marggravius* reckons up and describes nine sorts of them.

(b) J. de Laet, l. 15. c. 7. out of J. Lerijs, as he from Ovidus.

Yet whether he hath taken in this amongst them, seems doubtful. It is of the greater kind. From the point of his Bill to the end of his Tail, above four inches and $\frac{1}{2}$ long; His Bill black, almost an inch and $\frac{1}{2}$ long, as thick as a Shoemakers waxed Thread; sharp-pointed, and crooked all along like a Sithe, or exactly as the Bill of the *Guara* or *Indian Curlew*. His Head the third of an inch long, and as broad. His Neck two thirds. His Trunk an inch. His Tail an inch and $\frac{1}{2}$. In which there are ten black Rudder-Quills $\frac{1}{2}$ of an inch broad. Each Wing is two inches and $\frac{1}{2}$ long. Wherein there are sixteen Oar-Quills, of a blackish-brown or *Eagle-colour*, a little more than $\frac{1}{4}$ of an inch broad.

Of

Of which colour are the rest of the Feathers, and no where radiant, as of the other Species. His Thigh, $\frac{1}{2}$ inch long. His Leg, $\frac{1}{4}$. On which are four Toes, above $\frac{1}{4}$ of an inch long, and thick as a *Taylor's* Stitching-Thread. His Claws near $\frac{1}{4}$ of an inch long.

The Lesser HUMING BIRD. His Head is lost. From the top of his Breast, to the end of his Tail he is two inches long. But his Trunk or Body alone, is not above $\frac{1}{4}$ of an inch in length. The other Parts are answerable. His colour various: on his Wings and Tail, a dark-brown; on his Belly, a yellowish-Red; on his Breast, White; on his Back, Green, mixed with glorious golden Rays.

The Huming-Bird is every where ill pictur'd: even in Mr. *Willughby*, for want of the Bird it self. But all those Birds, at least, whereof he had the sight, are most curiously and exactly represented. He is said to have a loud, or shrill and sweet Note, emulous of that of a *Nightingale*. (a) He moves his Wings swiftly and continually, whether flying, or sitting on a Flower. (b) He feeds, by thrusting his Bill into a Flower, like a Bee. (c) For which purpose *Joh. de Laet*, describing this Bird, (whether out of *Oviedus* or *Lerius* is not plain) saith, That his Tongue is twice as long as his Bill. Which *Clusius* hath omitted; because he took his Description from the Picture only. *Gulielmus Piso* observeth also the same. And it is very likely to be so, as a Part more apt, by its length, and flexibility, to thrust and wind it self to the bottoms of the deepest, and most crooked Flowers: in which, and not the upper and open parts of Flowers, it is, that the Honey-Dew which these Birds, as well as Bees, do suck, is usually lodg'd.

His Feathers are set in Gold by ~~the Indians~~ *Ambrósio*, and sold at a great rate. (d) The *Indians* make of them very artificial Images. (e) They take them by mazing them with Sand shot at them out of a Gun. (f)

Piso relates, (g) as a thing known to himself, and many curious and credible men with him in *Brasile*, That there are there a sort both of *Caterpillars* and of *Butterflies*, which are transform'd into this Bird: and that in the time of Transformation, there is plainly to be seen half a *Caterpillar* or half a *Butterfly*, and half a Bird, both together.

Yet

- (a) Thevetus Gallus & Linschot. l. 2. p. 249.
(b) Lig. Hist. Barb.
(c) Ibid.

- (d) Charlt. On. Zoic.
(e) Will. Orn.
(f) Lig. Hist. of Barb.
(g) Hist. N. lib. 5.

Yet the same Author saith, That this Bird buildeth her Nest of Cotton-Wooll, and layeth Eggs. That a *Caterpillar* should produce a Bird; and a *Butterfly* too, the like; and yet this Bird lay Eggs to produce its own kind, are three greater wonders than any thing that hath been said of the *Barnacle*. But we will rather suppose these men were themselves deceived, than that they designed to deceive others.

CHAP. II.

Of WATER-FOWLES, particularly, of the Cloven-Footed.

THE HEAD of the JABIRU. The Bird is described by *Marggravius*, *Piso*, and *Willoughby*. He is bigger than a *Swan*. I will take leave to describe the Bill a little more fully.

'Tis above a foot and $\frac{1}{2}$ long; The Skull about three inches, and two broad. The Bill black, 13 inches long, an inch and $\frac{1}{2}$ broad underneath. Both the Beaks are bended upwards and crooked all along. The upper, an inch and $\frac{1}{2}$ high, consisting of one triangular Bone, having a sharp Ridge on the top, and is sharp-pointed. Its hinder edges are carved with oblique Furrows or Grooves. The Nostrils $\frac{1}{2}$ an inch long, an inch and $\frac{1}{2}$ before the eyes. The nether Beak an inch high, and concave, but one Bone, or if you please, two joyned together for the length of half a foot from the point.

The *oblique Furrows* in the Margins of the upper Beak, are a singular Contrivance of Nature, not only here, but in many other Birds, for the more safe reception of the nether Beak; *vidt.* least it should go awry either with-in or without the upper, as often as it is forceably pull'd to it, and so cause a dislocation, or a strain.

Another HEAD of the same kind and bigness.

The HEAD of an INDIAN HERON. I meet neither with the Animal nor with the Head any where described, or figur'd. The Skull is about three inches square. The

The Bill above $\frac{3}{4}$ of a foot long. The upper Beak from edge to edge near two inches over. Consists of one Bone, Triangular or Ridged at the top, a little crooked downward, Concave, and sharp-pointed. Its hinder *Margins* are obliquely furrow'd, as in the *Jabiru*. The nether Beak underneath two inches and $\frac{1}{2}$ over. Consisteth of two Bones, joyned together for the length of not above an inch and $\frac{1}{2}$ from the point, which is not above a fourth part of the length of Conjunction in the *Jabiru*. The edges of both the Beaks run along in a strait line.

Of the use of the oblique Furrows, before. According to the length of the said Conjunction of the bones of the nether Beak from the point, the Bird may be conjectur'd more or less voracious. For by how much this is the shorter, by so much more may the Skin of the Beak be dilated for the comprehending of the greater Prey: as is more remarkable in the *Pelecan*.

The HEAD of an INDIAN STORK. I find not the Bird, nor the Head, any where describ'd, or figur'd. The Skull is four inches high, and almost square. The Skin of the Neck, as it is stuff'd up and stretched out with Wooll, is a foot about; standing out with a bunch in the usual place of the Crop. The Bill it self is above a foot long: and three inches and $\frac{1}{2}$ high. The upper Beak, from edge to edge, two inches over; is one triangular, and sharp-pointed Bone, ridged at the top, and a little crooked downward; but with strait *Margins*, and obliquely furrow'd behind, as in the *Jabiru*. The Nostrils $\frac{1}{4}$ of an inch long, and two inches before the Eyes. The nether Beak consisteth of two Bones joyned together for the length of three inches from the point; the edges whereof are a little crooked upwards. Underneath, above two inches over. The edges of both the Beaks are made rough, like a Saw, with numerous small and oblique Incisions directed backward, or looking towards the Throat.

The same oblique and small Incisions are visible in the Bills of divers other Birds of the Rapacious kind; in all made for the more secure retention of the Prey.

Of our *Europæan Storks*, several of the Parts are used in Medicine, at least put into the *Materia Medica*; as the Stomach, Gall, Fat, and Dung. Of the same also are pre-

prepared *Oleum Stillatitium*, *Sal volatile*, *Aqua Antepileptica*, &c. *Vulgus, si decipi vult, decipiatur.*

They sometimes (saith Mr. Willughby (a) of the *Storke*) (a) Ornith. devour Snakes and other Serpents: which when they begin to creep out at their Breeches, they will presently clap them close to a Wall to keep them in.

A BUNCH of black FEATHERS, of the Crest that grows on the Head of the lesser ash-colour'd or grey *Heron*. The length of those whereof Mr. Willughby makes mention, was five inches; but of these, above eight. The *Turks* value these Feathers at a great Rate. It is reported, saies *Wormius*, That in *England* it is death, to kill a *Heron*. But our Lawyers know of no such Law.

The BALEARICK CRANE. He differs, as to his outward shape, but little from the *European*: saving that on his Head he hath a Crown of thick Hairs or Bristles very full and spreading. See the Description and Picture of the Bird in *Willughby's Ornithologia*.

I once dissected this Bird, but found not the same kind of Windpipe (with curious *flexures*) as is described by *Barthol.* (b) and Mr. Willughby; and by them observed in the *European Crane*. They are therefore so far two different Species. (b) Hist. Cent. 4.

The HORN of the UNICORNE BIRD; In *Brasile* called ANHIMA. Described by *Marggravius*, and *Willughby*, out of him. His principal marks are these; Headed and Footed like the *Dunghill Cock*, Tail'd like a *Goose*, Horned on his Forehead (with some likeness) as the *Unicorne* is pictur'd; Spurd on his Wings; Bigger than a *Swan*. The Male, say *Marggravius* and *Piso*, as big again.

The HORN was given by Father *Hieronimus Lobus*. In the Bird which *Marggravius* describes, the Horn was but a little above two inches long. But this is above three, and about as thick as a Bodkin. The top also of this is not sharp, as figur'd (and I doubt feigned) by the same Author, but blunt; and, contrary to what is seen in Horns, rather thicker than toward the bottom. It is but of a softish and brittle substance, inferior to the softest sort of Horns. Considering which, and the bluntness of it, as well as smallness, compared with the Bird, it cannot be

thought to be defensive or offensive, as a true Horn, but must have some other use.

Being taken in any convenient Liquor, saith *Piso*, to the quantity of about ʒij, it is often successful in Malignant Fevers, and against Poyson, by provoking sweat.

The SPUR of the UNICORNE BIRD. It grows as is above said, on the fore-Joynt of the Wings. Triangular, sharp-pointed, and an inch and $\frac{1}{2}$ long. Said by *Marggravius*, mistakingly, to be strait; it being crooked (a little upwards) as a *Cocks* Spur; and thereby fit more effectually to wound.

The HEAD of the SHOVLÉR or SPOONBILL. The former Name the more proper, the end of the Bill being broad like a Shovel, but not Concave like a Spoon, but perfectly flat. The extremity of each Beak is a little hooked downward. And they are both made very rough within with numerous and crooked *Striæ*. A device of Nature, for the better holding of the Prey.

This Bird is of affinity with the *Heron*-kind, from which he scarce differs in any Part, saving the Bill. He feeds on Shell-fish. Wherewith having fill'd his Crop, he lets them lie there, till the heat of it makes them open: whereupon disgorging them, he picks the meat out of the Shells. Related by *Gesner* out of *Aristotle*, *Ælian*, and

(a) Lib. 2. de
Nat. Deo-
rum. *Cicero*. (a)

The SEA-CURLEW. By the people of *Brasile*, called *Guara*. By *Clusius* and other *Latin* Authors, *Numenius Indicus*, and *Arcuata Coccinea*. Given by Dr. *Walter Charlton*. See the Description hereof in *Willughby's Ornithologia*. About as big as a *Shoveler*, long Leg'd, short Tail'd, with a Bill slender, long, and crooked like a Sithe. But that which is most remarkable, is the alteration of his colours, being at first black, then ash-colour'd; next white, after that scarlet, and last of all crimson, which grows the richer die, the longer he lives. (b)

(b) Joh. de
Lact lib. 15.
c. 13. & Wil.
Ornith.

The BRASILIAN MOOR-HEN, called *Jacana*. Given by Dr. *Richard Lower*. See *Marggravius's* Description hereof. The Colours not the same in all parts, as in that of *Marggravius*; the hinder part of the Back and Tail being here of a bright Bay or Chestnut, inclining to red: in his, only black and green mixed. Perhaps depending

depending on the difference of Ages as in the *Guara*. The Membrane wherewith he saith the Head is cover'd, in this, growing on the Bill, is extended only over the Forehead like an inverted Peak. He saith, that on all the four Toes there grows a Claw, $\frac{1}{2}$ an inch long: whereas the Claw of the hinder Toe or Heel is at least an inch and $\frac{1}{2}$ long. On the fore Joynt of each Wing, grows a Spur, as in the *Anhima*; but not above $\frac{1}{4}$ of an inch long, round, and exceeding sharp. Which is omitted also by *Marggravius*, but mention'd by *Piso*. She is remarkably distinguished from all other Birds, by the slenderness of her Legs and Toes.

CHAP. III.

Of PALMIPEDES, or WEBFOOTED FOWLES.

THE PHÆNICOPTER; So called from the scarlet-colour of his Wings. By the *French*, *Flammant*, for the same reason. Given by *Thomas Povey Esq.* There are an abundance of them in *Peru*. (a) In Winter they feed in *France*. See *Willughby's Description*. His Neck and Legs are exceeding long. When *Scaliger* therefore saith, (b) That he hath the shortest Legs of any Animal yet known; he would have said, the longest. But that wherein he is most remarkable, is his Bill. Which I shall describe more particularly.

(a) Joh. de Laet.

(b) Exercit. 233. S. 2.

The Figure of each Beak, is truly Hyperbolical. The upper is ridged behind; before, plain or flat, pointed like a Sword, and with the extremity bended a little down. Within, it hath an Angle or sharp Ridge which runs all along the middle. At the top of the Hyperbole, not above $\frac{1}{2}$ of an inch high. The lower Beak, in the same place, above an inch high; hollow, and the Margins strangely expanded inward for the breadth of above $\frac{1}{2}$ of an inch, and somewhat convexly. They are both furnished with black Teeth (as I call them from their use)

of an unusual figure, *sc.* slender, numerous and parallel, as in Ivory-Combs; but also very short, scarce the eighth of an inch deep. An admirable invention of Nature, by the help of which, and of the sharp Ridge above mention'd, this Bird holds his slippery Prey the faster.

What *Cardane* affirmeth of the *Phænicopter*, That he moves the upper Jaw or Beak, I have observed, saith *Wormius*, to be true. *Menippus* the Philosopher also, (a) cited by *Rondeletius*, saith the same. But *Wormius* adds, That the cause is not so manifest, as in the *Crocodile*: yet shews not, in what respect. Hereof see *Sect. 2. Chap. 3.*

(a) Lib. de
Homine.

As for the *Phænicopter*, it must needs be said, That the shape and bigness of the upper Beak (which here, contrary to what it is in all other Birds that I have seen, is thinner and far less than the nether) speaks it to be the more fit for motion, or to make the appulse, and the nether to receive it. But there can be no determination of these matters, without Inspection into the Muscles and the Articulation of the Bones.

Another PHÆNICOPTER. The Tongue of this Bird, as *Apicius* saith, was a delicious Morfel amongst the Romans.

(b) Orni-
thologiæ,
p. 259.

The GREATEST LOON. *Colymbus maximus five Arcticus Clusii*. Given by Mr. Houghton an Apothecary in London. Described by Mr. Willughby. (b) This is as big as a Goose: of a dark colour, dappled with white Spots on the Neck, Back, and Wings; each Feather marked near the point with two Spots. They breed in *Farr Island*.

The GREAT SPECKLED LOON of NORWAY. By the people there called LUMME. Described by *Wormius*, and out of him by Mr. Willughby. In the former, the Spots are fewer on the Neck, more on the Back: In this, more on the Neck, and fewer on the Back. There, each Feather hath two Spots; here, but one, near the point.

(c) Wil-
lughb. Or-
nith. p. 256.
(d) Ibid.

The Legs, both of these and the other *Species* of the Loon kind, are broad and flat, by which they are distinguished from all other Birds. (c) Their Claws are also broad, in shape almost like a mans Nail; as Mr. Willughby also observes. (d) They are called *Colymbi*, because they are great

great Divers. Their Legs are joyned to the Loins near their Rump; That they may both swim and dive with the greatest swiftness and ease. (a) And their Bodies being hereby extended so much the farther from the centre of gravity, it becomes the more laborious to them to walk, and so inclines them to keep more on the water, as their fittest place; (b) as the same Author much to this purpose.

The Skin of this Bird is sometimes worn on the Head and Breast to keep them warm; and preferred before the *Swans*.

The BILL of the GREATEST LOON. It belongs to the first *Species*, but the Bird was of lesser growth.

The two FEET of the GREAT NORWEGIAN LOON. (c)

The FOOT of the LESSER LOON, called the DIDAPPER or DOBCHICK. See the Description of the Bird in Mr. *Willughby*. All the *Loons* breed in *Mona*, *Farra*, and other *Scotish* Islands.

The FOOT of the SHAG, called *Graculus Palmipes*. See the Bird in Mr. *Willughby*. He is a little bigger than a Tame *Drake*. His Foot stands more sloping than in the *Loon*; the inmost Toe being the longest. It is observable, that of all Web-footed Fowl or *Palmipede's*, only the *Shag* and the *Cormorant*, are known to sit and build their Nests in Trees. (d)

The PELECAN. *Onocrotalus*, from the noise he makes like an *Ass*. See the Description hereof in *Aldrovandus*, *Willughby*, and others. I add, That the shortness of his Trunk or Body, in respect to the other Parts, is observable; not being a foot long: whereas from the end of his Bill to his Rump, he's near an Elbow long: and to the end of his Toes, he's above a yard and half. I shall describe his Bill a little more particularly.

The upper Beak, from the bottom of his Forehead, is fourteen inches long; behind an inch over, and convex or ridged; before, an inch and half over, and almost flat. It is composed of three Bones; the end of the middlemost is hooked like a *Hawk's* Bill; the edges of the two utmost are sharp, and bended downwards; all made rough within with five or six edged-lines running through the length of the Beak: thus well contriv'd for the holding the most slippery Prey. The end of the nether Beak, is almost like the

(a) Ibid.

(b) P. 258.
& 259.(c) Will.
Orn.(d) Will.
lugh. Ornith.
p. 248.

the Poop of a Ship. 'Tis in length sixteen inches, being extended (I think further than in all other Birds) an inch beyond the Eye: whereas the usual Picture, makes it to end as much before, or on this side it. Partly by this unusual production; the swallow is the greater, as fit for so voracious a Bird. It consisteth of two Bones, united together only at the end. To which, and part of his Neck, is subjoyned a Membrane vastly expansible; as appears in the Bird here preserv'd, capable of above two gallons of Water, and which *Franciscus Stellutus*, quoted by Mr. *Willughby* out of *Job. Faber*, saith, he lets hang down and contracts again at his pleasure. It may not be improperly called the Crop, which in other Birds lies under the Neck, but in this is extended to the very end of his Bill.

'Tis probable, that the use of this Bag is not only for the reception, but also the maceration of his Meat. And that having taken his opportunity to fill it, by contracting it, presses the meat down into his Ventricle and Guts, by degrees, as they are able to subdue it. Besides the luxury of the Taste, which perhaps he enjoys all the while it lies in his Throat. 'Tis also probable, that the meat being herein warm'd, and made a little tenderer, the Female doth disgorge part of it, wherewith to feed her Young. And might occasion the Fiction, of this Birds feeding her Young, with her own Blood.

The HEAD of a PELECAN. Another of the same. Also the nether Beak of another.

The SOLUND GOOSE. *Anser Bassanus*. See the Description hereof in *Gesner* and *Willughby*. He is in bigness and Feather very like a tame Goose. But his Bill longer, and somewhat pointed, more like that of the *Guilemot*. His Wings also much longer, being two yards over. Near *Colshill* in *Warwick-shire* there was one found, Nov. 1669. (by some means fall'n on the ground) alive, not able to raise her self up again for the length of her Wings. (a) But they scarce breed any where except on the Rocks of the Island *Bass* in *Scotland*, (b) from whence the Name.

(a) Will.
Orn.
(b) Ibid.

She hath this strange property, that she will swallow and disgorge again a great many Fishes, one after another; and at last, return with one (in her Crop) to her young

young Ones: related by *Gesner* from an observing *Scot*. It seems probable, that she tries which, of many will best agree with her own stomach, and when she finds one more delicate than the rest, she carries that to her Young. When they come to build, they bring so great a quantity of broken Wood with them, that the People there supply themselves from thence with as much as serves them for firing all the year. (a)

They are extraordinary fat. Out of their Fat the *Scots* make a most excellent Oil to be used in the *Gout*, and other Cases: Not inferior to that *Oleum Comagenum*, so much celebrated by *Pliny*. (b) The young *Goslings* are by them also accounted a great Dainty. (c)

(a) *Gesner*
out of *H.*
Boethius.

(b) *Gesner*
out of *H. B.*
and *Turner*.

(c) *Wil. Orn.*

The PENGUIN. So called from his extraordinary fatness. For though he be no higher than a large Goose, yet he weighs sometimes, saith *Clusius*, sixteen pounds. His Wings are extream short and little, altogether unuseful for flight, but by the help whereof he swims very swiftly. See his Description at large in the same Author; as also in *Wormius*, and *Willughby* out of both. I shall give a more full Description of the Bill.

'Tis black; from the corners of his Mouth four inches and $\frac{1}{2}$ long. But the Horns, or horny portions, whereof it chiefly consists, are shorter; in the upper Beak, a little more than three inches long; in the nether, two. Again, in the upper, it is obliquely prolonged from the Margins to the Forehead; contrariwise, in the nether, it is obliquely shorten'd from the Margins to that part under the Tongue. The upper Beak is an inch high, between the corners of the Mouth as wide, but presently rises up into a sharp Ridge. Its Edges about the middle, a little convex; about the end, concave and sharp. They are double Grooved, *sc.* before and behind. In the end, 'tis crooked. The nether Beak behind as much over, as the upper; towards the end, more compressed. Hollow like a Trough. Its edges sharp, and convex before; behind, they are groov'd. In the middle, it bunches out underneath. The upper Beak, is cut with seven or eight oblique and crooked Notches; the nether, with as many strait ones.

The height of the upper Beak; the sharpness, and the extuberance of the lower; together with the grooved Edges

Edges of both, do all give the Bill a sure hold, and wonderful strength. The three Grooves, as so many Joynts, keep the Beaks from distortion, when in case of missing the Prey, they are swifty and forceably clapt together. The sharp Edges of the nether Beak, serve instead of Teeth. The Bunch underneath, answers in some measure, to the strength of an Arch. The hight of the upper Beak, to that of a Board, when set upon its Edge.

The *Penguin* breeds in *Canada*, in the Island called *New-land*, in those of *Fero*, and of the *Magellanick-Sea*, and is therefore by *Clusius* called the *Magellanick-Goose*. They work themselves, as the *Coney*, deep Buries by the Sea-

(a) Wormi-
us.

fide. (a)
The AUK, RASOR-BILL, or MURRE. *Alka Hoiari*. See the Description in the forementioned Authors. She breeds on the Rocks of the Island *Mona* in *Scotland*. As also in those of *Fero*. Scarce so big as a tame *Duck*. His Bill is like that of the *Penguin*. But the upper Beak is sharper Ridg'd: and the Horny part of it shorter. The nether hath a lesser Bunch. The Notches also on both are fewer; whereof one or more of them are white, as Mr. *Willughby* rightly observes.

The HEAD of an AUK.

(b) Wil-
lugh. Orni-
thol.

The GUILLEMOT, so called especially in *Northumberland*; in *Wales*, the *Guillem*; in *York-shire*, the *Skout*; in *Cornwall*, the *Kiddaw*. (b) LOMWIA HOIARI. He's like the *Auk*, but bigger. See the Description hereof in *Willughby*; as also in *Wormius*. They build in *Norway* and *Island*. As also in *Farra* an Island in *Scotland*.

The HEAD of the GUILLEMOT.

The PUFFIN; called also *Bottlenose*, *Coulterneb*, *Mullet*, and *Pope*. *Anas Arctica Clusii*. Hereof see *Clusius*, *Wormius*, and *Willughby*. They are less than a tame *Duck*. Their Bill is much like to that of a *Penguin*, saving that the Horn of the nether Beak is not shorten'd, as there, but contrariwise obliquely prolonged from the Margins. 'Tis also shorter, and answerably higher, and therefore rather stronger. When they fight, they will hold by their Bills so hard, as sometimes to break one anothers necks, before they'l part. Whatever (c) they eat in the day, they disgorge a good part of it in the night into the mouths of

(c) Willugh.
Orn.

of their Pullen. They breed in *Island*, in the Isle of *Mona* in *Scotland*, in those of *Fero* and the *Syllies*; also in *Ireland*, and other places; laying their Eggs under ground.

The *Puffin*, *Penguin*, and *Guillemot*, all want the Heel or hinder Toe. Have all black Backs, but their Bellies, which are much under water, are White. All lay but one Egg at a sitting: proper perhaps to other Birds of this kind. (a)

(a) Willugh.
Ornith.

The HEAD of a PUFFIN.

The HEAD of the MAN of WAR; called also *Albitrosse*. Supposed by some to be the Head of a *Dodo*. But it seems doubtful. That there is a Bird called *The Man of War*, is commonly known to our Sea-men; and several of them who have seen the Head here preserved, do affirm it to be the Head of that Bird; which they describe to be a very great one, the Wings whereof are eight feet over. And *Ligon*, (b) speaking of him, saith, That he will commonly fly out to Sea, to see what Ships are coming to Land, and so return. Whereas the *Dodo* is hardly a Volatile Bird, having little or no Wings, except such as those of the *Cassary* and the *Ostrich*. Besides, although the upper Beak of this Bill, doth much resemble that of the *Dodo*; yet the nether is of a quite different shape. So that either this is not the Head of a *Dodo*, or else we have no where a true figure of it. I shall describe it as follows.

(b) Hist. of
Barbad. p. 61.

The SKULL is four inches long; the Bill, seven; two and $\frac{1}{2}$ high; one and $\frac{1}{2}$ broad. The upper Beak is hollow. Is composed of six Bones. The uppermost whereof is four inches and $\frac{1}{2}$ long, above $\frac{1}{2}$ inch high, and convex. The middlemost on each side, also four inches long, and about $\frac{1}{2}$ of an inch high or thick. The lowermost, above five inches long, and $\frac{3}{4}$ high. Their Edges are furrow'd with oblique and deep Grooves both before and behind. All these five Bones are refimated or bended upward, with some resemblance to a Saddle. The sixth, at the end of the Beak, is a wonderful strong Bone, crooked exactly like the Bill of a *Parret*, and hollow; by the bow, almost three inches, and near an inch over. Its Edges are very keen, and standing out with two sharp or pointed Angles. The Nostrils are $\frac{1}{4}$ of an inch long, and almost two inches

L

before

before the Eyes. The nether Beak is composed of three Bones. The two hinder, four inches long, near an inch high, and bended answerably to those of the upper Beak. Their Edges are cut with deep Furrows. The third, at the end of the Beak, is hollow, above an inch long, near as high. Its Edges very sharp, and hard, and exceedingly convex or bended downward. Underneath, a round and sharp Pin grows out from it in a level towards the Skull, near an inch and $\frac{1}{2}$ long. It was brought from the *Indies*.

The shape of this Bill shews it to belong to a Bird of Prey, and as is most likely, some great Sea-Fowl; which I will venture to call *The Great Indian Gull*. The strength of the end of the upper Beak is remarkable: as also are the sharp and hard Edges of the nether; and the Grooved Edges of both; the use whereof see in the Description of some other Birds, as of the *Jabiru* and the *Penguin*. The upper Beak seemeth to be composed of so many Bones, partly, that if a Fracture should happen to one, it might there terminate, and the rest be secur'd.

(a) Will.
Orn.

The GREAT GREY GULL, or the *Herring-Gull*. *Larus griseus maximus*. Perspicuously described by Mr. *Willughby*. Who only omits to say, that the upper Beak is bended upwards, as in the Bill above described; and (which is observable) that the Edges of the nether are not sharp, as is usual, but broad or expanded inward (and almost contiguous) as in the *Phœnicopter*. They (a) are very numerous near *Gravesend*.

Another GREY GULL, whereof the Rump, Tail, and upper part of the Wings are very white. Given by *Henry Whistler Esq;*

The TROPICK BIRD. So called, because said never to be seen but between the *Tropicks*. *Avis Tropicorum*. Well described by Mr. *Willughby*. He only omits the Denticulation of the edges of his Bill, or those small oblique Incisions, which, from their inward respect, are plainly made for the better retention of the Prey. Besides some very short Feathers on his Tail, he hath two Quills above half a yard long.

Another TROPICK BIRD like the former.

Another all over WHITE, except the fore part of

of the Wings. Both given by the forementioned Person.

The HEAD of the TROPICK BIRD.

The two Tail-Quills of the same.

CHAP. IV.

Of the EGGS and NESTS of BIRDS.

OF EGGS, there is here a considerable number: which therefore I thought fit to put altogether in this Chapter. Their Figures, as they stand together, appear the more various. For some are almost Sphærical or Round as a Ball: others, as the most, are more oblong. Of these, some few are perfectly Oval, *i. e.* with both the ends defined with two equal *Ellipses*: but most are Conical, or with one end sharper than the other. Of these again, most have their smaller end but Blunt; some few, very sharp. Lastly, almost all both Blunt and Sharp are Convexly Conical, *i. e.* they are all along Convex, not only *per ambitum*, but between both ends: whereas some few are Plano-Conical, whose Superfice is in part level between both ends.

Their Colours are also various; as White, Pale, Livid, Ash-colour, Blew, Brown, Green. Their Spots, and Speckles, are also Iron-colour'd, Red, Bay, Musk-colour, Black, &c. the Causes of all which, both Figures and Colours, were no unfit subject of enquiry. But here I can do little more than shew, to what Eggs in particular any of them do belong.

The EGG of an OSTRICH. 'Tis very smooth, and white; all over prickt as it were with extream small brown Specks. Almost of a Sphærical Figure. About half a foot, by its *Axis*, from end to end. Round about, by the breadth, sixteen inches, *i. e.* near five inches and $\frac{1}{2}$ strait over. Both the ends of an equal Convexity. Sometimes so big, saith Mr. *Willughby*, as to weigh fifteen pounds. The Shell is of answerable thickness, in regard to its bigness, to that of other Birds Eggs. They are sometimes set in Silver, and used as Cups.

Another white EGG, almost Sphærical. 'Tis scarce so long as a Hens Egg, yet is as thick, as that of a Goose.

A third white EGG, almost Sphærical. 'Tis scarce bigger than a little Nutmeg.

The EGG of a CASSOARY. The Shell underneath or within is white: without, it is all over rough-cast with a Testaceous Crust of a pale Green colour. It is of an exact Oval Figure, or with both ends equally Convex. In length, by its *Axis*, five inches, round about the breadth, eleven; *i. e.* a little above three and $\frac{1}{2}$ strait over.

Another EGG of a CASSOWARY, like the former.

Another EGG perfectly Oval, or with both ends equally Convex. Exceeding white, as big as a Pigeons Egg.

Another EGG perfectly Oval, but somewhat lesser, and of a light Ash-colour.

Another EGG exactly Oval, and also of a light Ash-colour, but no bigger than a Nutmeg.

The EGG, as I take it, of the lesser DIVER or LOON. In bigness equal to a Hens. Of a pale wan colour. Obtusely Conical, so as to come very near to an exact Oval.

The EGG, I think, of the WIGEON. It is of the same Colour and Figure as the last described: but somewhat lesser.

Another EGG like the two former, but a little lesser. Inscribed, *Arts*: perhaps of the *Anas Arctica* or *Puffin*.

The Egg, as it seems, of the AUK or RAZOR-BILL. Of a pale and livid colour, with Iron-colour'd Spots sprinkled all over it. Obtusely Conical. In bigness, between those of a *Turkey* and a *Hen*.

The EGG, perhaps, of the biggest Arctick Loon. It is of a dark Green colour, besprinkled all over with Spots of a fad Bay. Both in figure, and bigness, like that of a Goose.

The EGG of a CROW. Of a Blew colour, besprinkled all over very full with dark brown Spots. Obtusely Conical. As big as a Pigeons.

The EGG of a GOLDFINCH. Of a whitish Ash-colour, besprinkled with dark brown spots. Yet not every where, but only on the thicker end. It comes near to an exact Oval.

The

The EGG, I suppose, of a HOOP. It is longer than a large *Damascene Plum*. Obtusely Conical. Of an Ash-colour, stained with spots of a sad or deep Bay, and of a dark Brown.

The EGG of the KITTY. In Colour, Figure, and Bigness, not much unlike the last described: yet somewhat lesser, and almost exactly Oval.

The EGG of the CADEY. Perhaps the *Jackdaw*, by some also called the *Caddo*. It is of a pale Blew, besprinkled with dark Spots.

An ash-colour'd EGG, speckled with Spots of a sad Red. Obtusely Conical; and as big as that of a *Pigeon*.

The EGG of the SEA-MOIT. In colour, almost like the last described. In bigness like to that of the Hoop.

An EGG in shape and bigness, like a *Damascene Plum*. Dyed with a full Blew, and sprinkled here and there with a few spots of a sad Bay.

The EGG of a REDSTART. Of a whitish Ash-colour. Speckled on the thicker end only, with a few spots of a sad Bay. In figure and bigness almost like an ordinary *Acorne*.

A pale wan coloured EGG, in bigness not much unlike the former.

The EGG of a WAGTAILE. Of the same bigness with the last, but more Conical. Of a white colour besprinkled with very small and numerous specks of a blackish tincture.

An EGG of the same colour with that of the *Redstart*, but more Conical.

The EGG of a THROSTLE. Of a pale Blew, and speckled with a few spots of a sad Bay. As big as a lesser *Damascene Plum*. But with one end sharp.

The EGG of a STONERUNNER. Of an Ash-colour, besprinkled with sad Bay spots. Conical, and sharp. Of the bigness of a little Walnut. Here are four of them.

The EGG of a ROOK. Painted all over with Green and dark Brown spots. Conical, and sharp. Somewhat less than a *Crow's*.

An Ash-colour'd EGG, besprinkled with sad Bay spots. Conical, and sharp. Almost as big as a *Pullets*.

The EGG of the SEAMEW; perhaps, of the lesser GULL.

GULL. Of an Ash-colour tinged with blackish spots. In bigness equal to that of a *Hen*. But acutely Conical.

An EGG of a kind of Greenish Ash-colour. In bigness, and in shape like that of a *Stonerunner*. Here are two of these.

The EGG of the HORNPIE; perhaps, the SEAPIE. Of an Ash-colour mixed with a kind of *Citrine*, and stained with blackish spots. Almost as big as that of a *Hen*.

The EGG of a RED-SHANK. Of a kind of Straw colour, tinged with sad Bay spots. Most acutely Conical, or with one very sharp end. In bigness like to that of a *Rook*; but a little shorter.

The EGG, as I take it of the GUILLEMOT. Of a Green colour, stained with Black spots. Acutely Conical; and also, in part, level between both ends or Plano-conical. Somewhat bigger than that of a *Turkey*.

The EGG of a LAPWING. Of a kind of Citrine colour, stained with large black spots. Sharp, and Plano-conical. A little bigger than that of a *Redshank*.

The EGG of the SEACOB; a kind of GULL. Of an Ash-colour, besprinkled with little black specks. In shape very like to that of a *Lapwing*. But not above half as big.

The EGG of a HEN, with a thick knob so growing on its greater end, as to appear to have been originally liquid.

The EGG of a SWAN with another within it. Given by Sir *Thomas Brown* of *Normich*. Who hath also observed the like both in *Hens* and *Turkeys*. The utmost seemeth to be a little bigger than ordinary, *sc.* near five inches long by its *Axis*, and ten round about, or three and $\frac{1}{2}$ strait over. In shape like a *Turkeys*. The other which is included sticks fast to the side of the greater; whether it did so originally, as also whether both of them contained White and Yelk, is uncertain. It is of the same figure, about four inches long, bigger than the biggest *Hens* Egg. The Shell of the same hardness and thickness as that of the greater.

'Tis plain, that the lesser Egg was first perfectly form'd.
But

But not being big enough to provoke the *Uterus* to exclusion, new matter gather'd round about it for another Egg: and was the more easily supplied, because so little spent upon the former. And it may be noted, That Nature is so intent upon finishing her Work, that she may be observ'd much oftener to over do, than under do: you shall find twenty Eggs with two Yelks, or hear of twenty Animals with two Heads, for one that hath none.

From the Egg with the Lump at the greater end, it seems also plain, That the Shells of Eggs, although as hard as any Animal Stones, yet are not bred, as those, out of stony Parts visibly præexistent in liquor, and so cluster'd together: but out of a liquid substance, not much unlike to that which is separated by the Reins of Birds.

Of the figure of the Egg, it is observable, That it usually answers to that of the Body or Trunk of the Bird to which it belongs: as the Fruit is longer or broader, answerable to a tall or spreading Tree. And as it is a Transcript from the Original; so it self an Original for the next Copy. So those Birds that have a Rump and hinder Parts more Oval and spreading, as the *Duck*; or more Conical, as the *Dunghill-Hen*; breed, and are bred of Eggs alike shaped, *viz.* That so there may be sufficient, yet no superfluous Room, or Matter, for the *Chick*.

Of the Number of Eggs laid at one Breed, it is also worth the noting, That Land-Fowl, and of these especially, such as are Domestick, and whereof there is continually great destruction made, for the most part lay a considerable number of Eggs for one sitting. Whereas some Sea-Fowls, (as Mr. *Willughby* observes of the *Penguin*, and some others) lay but one. Because building upon the Rocks, where they are seldomer destroy'd, were they greater Breeders, there would not be room enough for the reception of the hundredth part of them.

The NEST of a little Bird of CHINA. Almost of a Semilunar Figure, and about two inches and $\frac{1}{2}$ broad. Of a white substance, becoming soft, being moistened, and transparent like a Gelly; whereinto it seems to be convetrible, in part, being boiled: and by the Gentry of *China* is esteemed a delicate sort of meat; although, like that of *Harts-Horn*, it hath no Taste. Outwardly, it is
more

more close and solid; within, consisting of parts loosely Netted together, as those in the middle of *Harts-Horns*, or some spongy Bones. See also a short Description hereof in *Wormius*.

The Birds breed in *Coromandel*, and build their Nests (as is supposed of the *Sperm* of Fishes) (a) on the sides of the high Rocks; from whence the Natives fetch them, and sell them to the *Chineses* at a great rate. (b)

(a) Gulielm. Pifo.
(b) Mus. Worm.

The TREBLE NEST of an *Indian* Bird, made to hang down from the Bough of a Tree, with three *Venters* or *Bellies*, and three *Necks* all open one into another. See the Picture of such a like one in *Willughby's Ornithologia*.

The NEST of another *East-Indian* Bird, which, to avoid the rapine of *Apes* and *Monkey's*, she hangs down from the Bough of a Tree, by a very long Neck. See the figure hereof also in Mr. *Willughby*.

The NEST of a little BIRD of *BRASILE*, which she hangs also on a Tree out of the reach of *Serpents*. About ten inches in length. The Structure admirable. The upper part by which it hangs to the Tree is a flat Label, about four inches long, and three over. To this the other two Parts, *sc.* the Neck and Belly of the Nest, are suspended. The Neck is five inches long; below, an inch and $\frac{1}{2}$ over; above, a little straiter. The Belly is likewise about the same length as the Neck, of an Oval figure, in the middle two inches and $\frac{1}{2}$ over. The Neck is open, not above, but below, at the very end: for this and the Belly hang at the Label, as you would imagine a Sack of Corn hung up by the middle, quite double. So that the Bird first ascends by the Neck, and then descends into the Belly of the Nest. It is composed of Reeds and other parts of Plants curiously woven together, like a piece of Hair-Cloath.

A GREAT NEST of an other *West-Indian* Bird. Above three quarters of a yard long, besides part of it broken off. Where broadest, near a foot over, and almost flat. Narrowed from the bottom all the way to the top. It hath two Apertures. Above, about a foot from the top of the intire Nest, one larger and longer; below, *sc.* $\frac{1}{2}$ a foot above the bottom, another perfectly round, and three inches over. It consisteth of the parts of Plants somewhat loosely woven together. The Invention seemeth very

very subtle. The entry above, for the Bird her self; her Eggs and Chicks hanging safe at so great a depth; the lower, till these are fleg'd, being in the mean time stop'd up with Feathers, Moss, or other like materials: but afterwards laid open for them, that cannot reach the top, to fly out at below.

SECT. V.

OF FISHES.

CHAP. I.

OF VIVIPEROUS FISHES.

THE RIB of a TRITON or MAREMAN. About the same length with that of a Mans, but thicker and stronger; and nothing near so much bended. The Fish to which it belonged, was taken near *Brasile*. Of this kind, *Wormius*, in his *Musæum*, gives us divers Relations, together with the Descriptions of several *Species*. See also *Joh. de Laet*. (a) of the same. And *Barlæus*, who saith, (a) L. 15. That in *Brasile* he is called *Ipupiapa*. c. 12.

A BONE said to be taken out of a MAREMAIDS HEAD. It is in bigness and shape not much unlike that called *Lapis Manati*; but the knobs and hollows thereof are somewhat different.

One JOYNT of the ~~BACK~~-BONE of a WHALE. By *Anatomists* called a *Vertebra*. ~~Formerly~~ one of those Parts or Joynts which answers to one single Rib on each side. It weigheth Thirty pounds *Haverdupois*. In length, *i. e.* by the length of the Back-Bone, near $\frac{3}{4}$ of a foot; above a foot high; and three quarters of a yard broad, *i. e.* by the breadth of the *Whale*. The Hole in the middle of it, which the Marrow of the Back passeth through, near half a foot over. All its Knobs, are much alike those in *Quadrupedes*.

M

The

The PISLE of a WHALE. In length, above a yard. Near the Root $\frac{1}{2}$ a foot round about, notwithstanding its being now dry and much shrunk. From thence it tapers to the very end, which is scarce one inch about. 'Tis now as hard as a Horn.

Part of the EAR-BONE of a WHALE. 'Tis as hard, and heavy for its bulk, as any Bone whatsoever. As big as a labouring mans Fist: The same Bone which in an Ox, is little bigger than a Nutmeg.

Part of a BONE said to be taken out of the Brain of a *Whale*, taken near the *Bermudas*. Given by Dr. *John Wilkins*, the late Bishop of *Chester*, to whom it was sent from thence. It seems to be part of the Brain-Pan, that was broken off and struck into the Brain, when the *Whale* was taken.

A ROUND BONE of a WHALE. Given by Dr. *Walter Pope*. 'Tis almost a foot Diametre, and in the middle about five inches thick. 'Tis rounded on the Edges, and thinner than at the middle, resembling a thick *Holland Cheese*.

Three more Round BONES of a WHALE; all of them lesser, and one ratably thicker than the former; the other thinner, like a white penny Loaf. The third the thinnest, almost like a Tansey.

(a) Musæ-
um.

Wormius (a) makes mention of a *Manuscript*, entituled, *Speculum Regale*: but written in the ancient *Danish-Tongue*, as he saith is supposed, by King *Suerron*; in which are reckon'd up two and twenty kinds of *Whales*: of all which he gives a brief account in his *Musæum*. Of which, the last save one, is said to be sometimes almost an hundred and thirty Elms long. The last of all, liker a little Island, than an Animal.

(b) Hist.
Cent. 4.

Bartholine (b) also reckons up the same number; but with some different Names, and a different Account; which he gives from a *Manuscript History* of the Fishes of *Iceland*: which, saith he, a curious and observing Shepherd of *Iceland* sent to *Wormius* some years before his death, with all their Figures. But how these two accounts agree, I see not. I would not think, That *Wormius* did here put in the King, and leave out the Shepherd, to make the story better.

On

On the Snout of one of these *Whales*, called *Hoddunefur*, grow about five hundred horny flat pieces, which *Taylor*s in *Denmark* use in making of Cloaths. (a) The same in (a) Ibid. substance, with that we call *Whale-Bone*, belonging to the Finns. In *Island* they are so commonly taken, That the hard Bones are there used for the impaling of Houses and Gardens. (b)

The HORN of the SEA-UNICORNE. Given by (b) Mus. Rom.
Sir *Joseph Williamson* now President of the *Royal-Society*. It is an entire one, eight feet long, or about two yards and three quarters. Very beautiful in length, straitness, whiteness, and its spiral Furrows bigger and less, making about seven Rounds from the bottom to the top, or point. At the *Basis* or bottom, about seven inches round. From thence, for about a foot, it swells a little, and then again grows slenderer, all the way, and so ends in a sharp point. 'Tis also conically hollow at the *Basis*, for near three quarters of a foot deep.

The same Horn (together with the Fish it self, sometimes above 30 Elms long,) is described by *Wormius*. (c) (c) Museum Wor.
But I cannot, with him, call it a Tooth. In that, it performeth not the office of a Tooth, but of a Horn. Neither doth it stand as a Tooth, but horizontally. Nor is it fixed in the Mouth, where all Teeth stand, but in the Snout. The reason why he calls it so, is, because it is fastened in the Snout, as Teeth are in the Jaw. See also the Description hereof in *Bartholine*. (d) But in that he makes it to be (d) Hist. Cent. 4.
Gyris Intortum, is not (at least as to this Horn) so clearly expressed: the Horn it self being strait, and not writhen, but only surrounded with spiral Furrows. The same is also transcribed by *Terzagi* out of *Wormius*, into *Septalius's Museum*.

Of the Virtue hereof, *Wormius* mentions two Experiments. The one, upon its being given to a Dog, after a Dose of *Arsenick*: but he expresseth the quantity of neither. The other, upon twelve Grains hereof given after a Drachm of *Nux Vomica*. Both the Dogs lived; whereas two other Dogs having the same Doses, without the Horn, died. Both experiments are attested by several Physicians of Note.

The credit of these Persons is not doubted. But the

question is, Whether these Dogs might not have liv'd without the Horn. As some Dogs that have been bitten by an *Adder*, have been observ'd to get over their Convulsions, and recover. It is also said in one of the Experiments, that the Dog which liv'd, vomited: and in the other, there is nothing said to the contrary. The question therefore is, Whether many other things, which will cause vomiting, may not do as well, as this so much celebrated Horn?

Whatever it may perform against Poison, it hath, saith *Bartholine*, been very successfully used by Physicians in Malignant Fevers. As in that, which at *Copenhagen* in the years 1652, and 1653. was very brief: and which it carr'd off with very great Sweats. (a) It was used also by *Albertus Kyperus* at *Leyden* in the Year 1655. in the like Case, and with the like success. (b) And that the sweating proceeded not meerly from Nature's own strength over the Disease, but as she was helped by the use of the Horn; seems probable from what *Bartholine* further saith, (c) That a scruple or $\frac{3}{4}$ hereof being given in *Carduus-Water*, or other convenient Liquor, causeth a free and copious sweating, even in those that are not used to sweat, except with much difficulty.

Heretofore, the chief Bishops in *Denmark*, used to make their *Episcopal* Staffs of these Horns. (d) The Natives of *Groenland*, and other Places where the *Sea-Unicorne* is taken, arm the sharp ends of the thickest and longest of these Horns with Iron Beards, and so use them for the wounding and taking of *Whales*.

The *Sea-Unicorne* is it self a lesser *Whale*, and is that Species which the People of *Island*, where there are many, call *Narwhal*. The figure which *Olaus Magnus* gives of the Head, is fictitious.

A PIECE of the SEA-UNICORNS HORN.

The SAW-FISH. *Pristis*. *Johnston* hath given a good figure (e) hereof, but without either Name or Description. And that of *Wormius* is defective, and in some particulars, out.

This here is a young One; from the end of the Saw to the end of the Tail, four feet. The Saw it self above a foot; near its *Basis*, two inches broad; at the fore-end, one

one. Armed, on each side, with seven and twenty Spikes, each $\frac{1}{2}$ an inch long, bended a little backward, and with two sharp edges behind, as the Spur of the *Unicorne* Bird hath above.

His Head very flat, about three inches long; behind, almost four inches broad; before, two. His Eyes an inch long, as much behind the Snout, two inches distant. Above $\frac{1}{2}$ an inch behind his Eyes he hath two Spouts, about $\frac{1}{4}$ of an inch wide, by both which (as some Fishes by a single one) he casts out the Water, which in taking the Prey, or otherwise, he receives into his mouth. Beneath, close by the Root of the Saw, are two oblique Nostrils, an inch distant, figur'd like the letter S. An inch behind these, his Mouth, two inches and $\frac{1}{2}$ over. His Lips are rugged with extream small round knobs. He hath no Teeth.

The Apertures of his Gills are five; placed obliquely, not on his sides, but his Breast, about four inches behind his Mouth.

His Trunk or Body presently behind his Head, becomes five inches broad, and about three high; from whence it is again extenuated all the way to the end of his Tail.

He hath seven triangular Finns. On the bottom of his sides, two Gill-Finns, not behind the Gills, as in most Fishes, but for a good part before them; near eight inches long, above three broad, and almost horizontal. Three inches behind these, two Belly-Finns, two inches broad, five long, and as much distant. Directly over these, on the Back a fifth, four inches long, above three high. On the Back also, but near the Tail, a sixth, four inches long, and as high. The Tail-Finn, as it were half a Finn, being $\frac{1}{2}$ a foot high, but underneath level with the Tail.

Cover'd all over with a tough and dark-colour'd Skin, somewhat rough, as you draw your hand forward: from the Belly-Finns to the end of the Tail, as it were pinched together into a little Ridge on each side. There are many of them in the *Indian-Sea*.

The reason why he hath two Spouts, seemeth to be the flatness and breadth of his Head or Mouth; in which the Water lying more spread, could not so expeditely be carri'd off by a single one in the middle, as by one on each side.

He

He is said to defend himself from the *Whale* with his Saw. Wherewith, by its structure, 'tis plain, that he fetches his stroak backward or side-ways, the Spikes being bended, pointed, and edged, and so made to prick and cut, that way.

The SAW or SPIKED SNOOUT of the SAWFISH. 'Tis a very large one, four feet long, or above an El'n by three inches. Its *Basis*, excluding the Spikes, seven inches broad. On each side are seventeen Spikes, most of them two inches and $\frac{1}{2}$ long, and figur'd as above described.

The length of the Fish before described, from end to end, if compar'd with the Saw is as four to one. Therefore the Fish, to which this Saw belong'd, was near five yards and half long. Again, the number of Spikes in the Saw of the Fish now describ'd, compared with those in this great Saw, is somewhat more than as three to two. Therefore had the said Fish liv'd to the Age of this to which the great Saw belonged, it would have been eight yards in length.

Five more such like SAWS, somewhat less.

The HEAD of the RAPIER-FISH; called *Xiphias*. By the *Brasilians*, *Araguagua*. He is pretty well described by *Rondeletius*. Grows sometimes to the length of five yards. The Sword, which grows level from the Snout of the Fish, is here about a yard long, at the *Basis* four inches over, two edged, and pointed exactly like a Rapier. He preys on Fishes, having first stab'd them with this Sword. (a) The *Whale*, saith *Ligon*, to shake off the Sword-Fish and *Theshall*, his two mortal enemies, leaps sometimes more than his own length above water. (b) He is taken frequently in the *German Ocean*; as also in the *Black-Sea*; and sometimes in the *Danuby*.

(a) Charl.
Onom. Zoic.

(b) Hist. of
Barb. p. 6.

The HEAD of the TUCK-FISH. Of the Sword-fish kind, but a different *Species* from the former. Whether it be any where describ'd, seems doubtful. The hinder parts of the Head are here broken off. The Snout is not so flat as in the Rapier-fish, but thicker and rounder, more like a *Tuck*, from whence I take leave to name it. 'Tis half a yard long; near the Head, two inches over; about the middle, one. Not with a flat point, but one perfectly round. The upper part hereof is smooth, the nether rough,

rough, the smooth and rough parts continu'd obliquely from the Point to the Root. Both the Chaps are also rough in the same manner, in the place of the Teeth, which this Fish hath not. The nether Chap hath also a different shape from that of the Rapier-Fish: this being not above four inches over, that half a foot; yet both are a foot long. It is compos'd of two Bones, so joyn'd together, for the space only of an inch and half, as to make a sharp point.

Marggravius and *Piso* (and out of these *Johnston*) describe an *American-Fish* by the name of GUEBUCU, of kin to this, the Head whereof is here describ'd. But cannot be the same, unless both the Pictures which they give, and *Marggravius's* Description (who particularly saith, That the Snout is sixteen inches long, the nether Chap, ten) be false. For in this Head, the nether Chap is broader, and comparatively not near so long.

The HEAD of the UNDER-SWORD-FISH. It is described by no Author that I have perus'd. The Fish seems to be a smaller kind. The Head is of a triangular figure, having one acute Angle below, and a blunt one on each side. An inch and quarter high; the Forehead an inch over, flat, and scaly. In length 'tis about two inches and a quarter. The Eyes, proportionably, exceeding great, *sc.* three quarters of an inch over. The Snout half an inch broad, not above $\frac{1}{4}$ of an inch long, a little ridged in the middle. The Chaps, instead of Teeth, are rough with many little Asperities, almost as the skin of a *Scate*.

The Sword grows in a level, not from the upper but the under Jaw, from whence we may give the Fish his Name. In length three inches; near the Jaw half an inch over, from whence growing narrow all the way, it endeth in a Point like that of a Sword. It is not round, but flat, as that of the Rapier-Fish, and in like manner two-edged. It seemeth to be compos'd of two Bones, but very firmly coherent edge to edge all the way. Whether this Fish be Viviporous, is uncertain; yet being of the Sworded-kind, I have ventur'd here to describe the Head.

A pair of the MANATEE-STONE'S. Taken out of the Head of the SEA-COW, by the *Indians* called *Manati*. Bigger than the biggest sort of Walnuts; with several knobs

knobs and hollows, like as in the Ear-Bone, but much greater. It is said by *Joh. de Laet* to be much commended against the Stone. There are two of them in every Head.

The Head of the *Manati* is like that of an Ox or Cow, from whence the *English* Name; his Eyes little; his Body long, like that of an *Otter*; his two Feet like an *Elephants*. Sometimes he is about thirty five feet or twelve yards long, and four broad. (a) He feeds not on Fishes, but the Grasse on the banks of the Creeks and Bays. (b) Calves and suckles her Young (as some other Fishes) with two Duggs. (c) A certain *Indian* King kept and fed one of them with Bread six and twenty years in a Lake near his House, which grew tame, beyond all that the Antients have written of *Dolphins*: He would sometimes carry ten people on his Back, with ease, across the Lake. (d) They breed in *Hispaniola*, *Jamaica*, *Brasile*, and other places.

(a) Charl.
Onom. Zoic.
out of Hieron.
Benzon. Hist. N. Orb.
l. 2. c. 14.
(b) Traph.
Disc. of Jam.
(c) Ibid.
(d) Charl.
On. Zoic. out
of Petr. Martyr.

The BALANCE-FISH. *Zygæna Libella*. Curiously pictur'd in *Salvian*. Where also see the Description. He hath his Name not unaptly from the shape of his Head, very different from that of all other Fishes, being spread out horizontally, like the Beam of a Balance; his eyes standing at the two extremes, as the iron Hooks do at the end of the Beam. He grows sometimes to the length of four or five yards: but this is a young one. They breed in the *Mediterranean*, especially, saith *Bellonius*, near *Smyrna*.

The HEAD of a great BALANCE-FISH. It is two feet $\frac{1}{2}$ over, or from eye to eye. The Head of the lesser now mention'd, is five inches over, the Fish, 20 inches long. That therefore to which this great Head belong'd, was ten foot long.

The SKULL of the MORSE: so called by the *Muscovites*; by the *Danes*, *Rosmarus*. He hath four feet, and his Body shapen not much unlike the SEA-CALF. But groweth sometimes to be bigger than an Ox. In his upper Jaw, he hath two remarquable TUSKS, bended a little inward. In this Skull, the exerted part is five inches long, and four round about at the Root. His other Teeth are undescrib'd. They are sixteen, eight on each Jaw. Not Grinders but Punchers, or somewhat answerable

able in shape to the Tusks of a Dog. In the upper Jaw, the longest; standing on each side, two or three of them, within side of the Tusks. They have a small flat on their insides, against which the Teeth of the under Jaw work; which are much smaller, and flat-sided. The shape of these Teeth seems no way fitted, and their strength very superfluous, for the eating of green Leaves at the bottom of the Sea, as this Animal is supposed to do.

The Figure which *Olaus Magnus* gives of this Animal, is fictitious. But that in *Joh. de Laet* (as to the Head at least) is a very good one: from whom *Wormius* borrows his. One of the Cubs is accurately described by *Everh. Vorstius*, quoted by *John de Laet*, by *Wormius*, and by *Terzagi* in *Septalius's Musæum*. This Animal, when he goes, drags his hinder part after him, as the Seal. They always, saith *Scaliger*, (a) come on Land in Companies; and when they sleep, one of them, as among *Cranes*, is set to watch. They climb upon the Rocks on the Sea-side by the help of their great Tusks, wherewith, as with two Hooks, they hold themselves from slipping. They breed numerously near *St. Lawrence Isle*. (a) Exer. 218. S. 4.

Their Tusks are used by the *Turks* and *Tartars* for the making of Sword-Handles. (b) I have a Girdle, saith *Wormius*, (c) composed of Plates made of these Tusks; which being worn, is an infallible Remedy against the Cramp: *à Spasmo proculdubio immunes reddit.* (b) Musæum Wormianum.
(c) Ibid.

A piece of a MORSE-HIDE. Than which, saith *Wormius*, I believe there is no Animal hath one more close and solid. I add, nor perhaps any that hath a thicker, being above half an inch thick.

A PISLE, said to be that of the MORSE. 'Tis above a foot long, and seems to be only the exerted Part. At the Glans, half a foot about; now it is dry. The *Muscovites*, saith *Vorstius*, (d) take the Powder hereof to bring away the Stone. (d) Quoted by Laet, l. 2.

The MALE or WHITE SHARK. *Canis Carcharias mas.* See the Description hereof in *Rondeletius*. This is about two yards long; and near $\frac{1}{4}$ of a yard over, where thickest. But they are found sometimes seven or eight yards in length, and more. One hath been taken, saith *Gesner*, from an other person, near four thousand pounds weight.

weight. The sharpness and multitude of his Teeth especially, and the wideness of his Mouth, are remarkable. They will often bite off the Legs or Arms of those that venture into the Sea in a Calm ; and sometimes swallow them up whole. (a)

(a) Ligon's
Hist. of Barb.
P. 5.

Their Teeth generally stand in a six-fold Row ; but *Bellonius* observes one with four Rows only. There are some other Fishes which have as many, and the Scate hath more : but take their Number and Bigness together, and they are more considerable. In *Septalius's Musæum*, there is one, saith *Terzagi*, (in words at length) with a thousand and two hundred Teeth. But neither hath this here, nor had any other that I ever read of, near half so many.

Of his Optique Nerves, *Rondeletius* observes, That they are not, as in other Animals, but plainly *Cartilaginous*.

(b) Out of
Laet.

The *Goldsmiths* in *France*, saith the same Author, set the Teeth of the *Shark* (which there they call *Serpents Teeth*) in silver-Cases ; and the Women hang them about their Childrens Necks, to make them breed their Teeth the better. The Brain of the *Shark*, saith *Wormius*, (b) is highly commended by some for the Stone. The people of *Island*, saith the same Authour, boil them for Lamp-Oil. They are found sometimes upon our own Coast, near *Cornwall*.

The LONG-SNOURED SHARK. So I call it, because it is much longer, than in the above-mentioned ; so as to be as it were the beginning of a Horn. The Body of this likewise, in proportion, is much shorter and thicker. *Rondeletius* seems to give the Figure of this particular *Species*.

(c) Hist. An.
l. 2. c. 1. near
the end.

There is no sort of Animal, saith *Aristotle*, (c) about us, which hath a double Row of Teeth. So that he never saw a *Shark*, nor divers other Fishes that are commonly known, and such as are not unlikely to breed about *Greece*. That he includes Fishes, is plain by the Context.

The GILL-FIN of the long-snouted *Shark*.

The JAWS of a SHARK. There are six or seven pair of these here preserved. *Terzagi* mentions one pair in

in *Septalius's Musæum*, that were wide enough to have swallowed any Man.

Two great TEETH of a SHARK. They are both curiously indented, like a Saw, on each edge: as also the Teeth are in younger *Sharks*, but not so visibly. One of these is above an inch and half long. But one of those in a *Shark* of above two yards in length, is not half an inch. The *Shark* therefore, to which This belonged, was about eight yards long.

What the Teeth of a *Shark* wants in thickness, they have in breadth, whereby they are the more terrible; both pricking with their Points, and cutting with their Edges at the same stroke.

Part of the BACK-BONE of a SHARK.

The TOOTH of a PICKED-DOG. Not much unlike that of a *Shark*. The difference is, That the exerted part of this is bended, not inwards, but side-ways.

The SPOTED HOUNDFISH or SEA-PANTHER; *Galeus Asterias*; because of the Stars or Spots upon his Skin. But the radiation of the Spots in the Figure commonly given, is fictitious. See *Rondeletius's* Description. He hath a rough Skin, as have all of this kind. Yet this Author saith, he hath a smoother Skin, than the *Galeus lævis*: which, however comparatively taken, it may be true, is not well expressed of either. The said Roughness is caused by an infinite number of most hard and sharp Prickles, composed in the same manner as the Scales of Fishes.

The Female brings forth often times twice in one month, and so is said to *Superfætare*: which, saith *Aristotle*, (a) (a) Hist. An. lib. 6. c. 11. & l. 5. c. 10. seems rather to be, because her Eggs are hatched (in her Womb) one after another.

The PICKED-DOG. *Galeus Acanthias*. Because he hath two strong and sharp Spikes growing on his Back, behind the two Finns, and pointing towards his Tail. See the Description in *Salvianus* and *Rondeletius*. Besides the two Finns which grow on each side the *Anus*, the Males, saith *Salvian*, (b) (b) Hist. 42. have also two Appendices, one on each side the *Anus*. But betwixt the *Anus* and the Tail there is no under-Finn; by which he differs from the rest of the Dog-kind. He is said scarce to grow so big, as to exceed twenty pounds in weight. His Skin is rough with the like Prickles,

as in the former; so small, as scarcely visible without a *Microscope*. But easily felt by drawing your hand towards the head. The shape also of the Teeth is odd and unusual, being armed with little sharp Hooks on each edge. They are taken sometimes upon our *English* Coast.

The Anatomy of the *Galeus* (the Male) is given us by Sir George Ent, in Dr. *Charleton's Onomastic. Zoic*. Some of the most observable Remarks, are the peculiar shape of the *Pancreas*, and especially the Spleen, having a Label produced from one side, above twice its own length. Likewise the Purse at the farther end of the *Duodenum*, into which it opens only by a very small round Hole, not so wide as to receive the end of ones little finger: all which are described and figur'd. He hath also growing on the lower Eye-lid, a thick and firm Membrane, wherewith he often winkles or covers his whole Eye: the same with that called the *Periophthalmium*, common to very many Birds.

The Description of the Viviparous Eggs in the Female; which are not unlike to those of the *Raya*, is given by *Rondeletius*. *Bellonius* hath seen an indifferent One, to bring forth thirteen young ones at a Birth. So soon as ever she hath brought them forth, they swim along with her, and if any of them are afraid of any thing, it runs immediately into the Mouth, say some, into the Womb of the Dam: when the fear is over, returns again, as if by a second Birth.

The Skin is used for the polishing of Wooden and Ivory Works.

The HEAD of a DOLPHIN, about a foot and $\frac{1}{2}$ long. The *Dolphin* therefore to which it belong'd, was above two yards and half long. In the Skin, 'tis hard to find any passage of sound for Hearing. And *Aristotle* denies that the *Dolphin* hears. But *Rondeletius* truly saith, that he doth, and that the whole structure of the Internal Ear may be seen in the Skull. See *Bellonius's* Description and Figure of the Dam and her *Fætus*.

The HEAD of a DOLPHIN, lesser than the former.

The TAIL of the DOLPHIN. It is expanded (as also in the *Porpefs*) in a way peculiar, not uprightly, as in other Fishes, but horizontally: by the help of which, he makes his Gamboles above the Water. And at the same time

time takes his Breath : as Mr. Ray hath well observed of the same use in the *Porpefs*. It is also of use to caſt him forward by ſtrong and repeated jirks, whereby he is ſo admirably ſwift, as it's ſaid, above all other Fiſhes. (a) There is alſo another *Dolphins* Tail here preſerved of the ſame bigneſs. (a) Phil. Transf. N. 76. p. 2275.

The SKELETON of a PORPESS, or Sea-Hog. (b) The Description and Anatomy of the Animal is given us by *Bartholine* (*Hiſt. Cent. 2.*) By Mr. Ray (*Phil. Transf. N. 76.*) By *Dan. Major* (*Miſcel. Curioſ. German. An. 4.*) And lately more largely by Dr. *Edward Tyſon*. Some of the particulars more remarkable are, That the Fat, which is an inch thick, encompaſſeth the whole Body, as in a Hog. That the *Fibers* which run through the Fat from the *Membrana Carnoſa* to the Skin, do obliquely decuſſate one another like a Lattice. And I may here obſerve, That the like Decuſſation is made betwixt the white and red *Fibers* of all *Muſcles*. (b) Turſio Plinii. Phocaena Rondeletii.

'Tis further noted, That the Fat is nothing elſe but Oil contained in a great number of little Bladders. I add, That all theſe Bladders are the continuation of the *Fibers* which decuſſate, in a finer Work. And that there is no difference betwixt the ſaid *Fibers* and thoſe of the *Membrana Carnoſa*, ſaving their Relaxation, (as when a Spung ſwells with water) by the interpoſition of Oil.

The Stomach remarkable, conſiſting of three Bags. The Guts eleven times the length of the Fiſh. The Glands of the Kidneys ſo diſtinct, that each having a white ſubſtance in its centre, and out of that its *Papilla*, ſeemed to be another little Kidney, about the bigneſs of a large Peas. And I ſhall here take notice, That the whitish ſubſtance within every Gland, and the ſame which is in the Kidneys of other Animals, is truly Carneous or *Muſcular*, by which the conveyance of the Urinous parts of the Blood into the *Pelvis* is promoted.

The Paps are placed one on each ſide the *Pudendum*. The *Ovaria* (it being a young Fiſh) not above an inch long, and thick as a Goole-Quill. The Diaphragme, without the uſual Tendon in the centre. The Heart, with two Ventricles and two Auricles. The Foramen Ovale, cloſed. The Lungs conſiſting of two great Lobes. The *Larynx* very

very prominent, oddly shaped, like an old fashion'd Ewer. The Spout with strong Muscles; and *Papillæ* for the issuing of Snot. The Eye with the *Musculus Suspensorius*, as in Bruits. The Brain large, weighed above lbj *averdupois*, the Fish lbxcvj . The *Musculus Psoas*, and two others on the Back, very large and strong.

The Teeth (96 in all) so placed, that those of one Jaw, are received into the distances of the other. Stand not in distinct Sockets, but all in one common Furrow. The Ear-Bone is oddly seated in a hollow, and encompassed with Muscles. The *Drum* well braced, but no *Incus stapes* & *Malleolus* to be seen. The Brain-Pan five inches broad, and but three long; the Brain answerable. The Back-Bone is composed of sixty *Vertebræ*. The same number, as is before observed to be in that of a Crocodile. The Bones of the Fore-Finns, resemble those of an Arm with Hand and Fingers. Of the Tail, like those of two feet joyned together.

From the Nose to the Tail-end about an Ell long, and roundish, the Eyes and the Gape of the Mouth small, the Back and upper parts black, the Belly white, the Tail horizontal: much like a *Dolphin*, saving that she is shorter snouted.

The SEA-CALF or SEAL. *Phoca. Vitulus Marinus*; From the noise he makes like a Calf. See *Rondeletius's* Description. His Head comparatively not big; shaped rather like an *Otters*; with Teeth like a *Dogs*; and Mustaches like those of a *Cat*. His Body long, and all over hairy. His fore-Feet, with Fingers clawd, but not divided; yet fit for going. His hinder Feet, more properly Finns, and fitter for swimming, as being an Amphibious Animal. The Female gives suck, as the *Porpefs* and other Viviparous Fishes. This here is about a yard long. But sometimes they are as big, saith Mr. Ray, as a Heifer of two years.

The Skin of this Fish is commonly used for the covering of Trunks. They are innumerable in the *Atlantick-Sea*; especially the Bay there called *The Seal-Bay*. (a) Our Mariners and Fishermen often take them in the *Isle of Wight*, as they lie asleep upon the Shore. (b) As also about *Cornwall*.

Another SEAL like the former, only somewhat thicker. Given by Mr. J. Houghton, Ph. L. The

(a) Laet.
l. 13.

(b) Charl.
Onomast.
Zoic.

The LONG-NECK'D SEAL. I find him no where distinctly mention'd. He is much slenderer than either of the former. But that wherein he principally differs, is the length of his Neck. For from his Nose-end to his fore-Feet, and from thence to his Tail, are the same measure. As also in that instead of fore-Feet, he hath rather Finns; not having any Claws thereon, as have the other kinds.

The SKULL of a SEAL. Given by *Henry Whistler Esq.* The Teeth are shaped somewhat like a *Dogs*. The tops of them all are flat, being doubtless filed off. The *processus* of the *Os Frontis* which makes up the Orbit of the Eye in Land-Animals, is here wanting; and the said Bone pinched up much more narrowly: Both to make room, as it should seem, for a very large Eye. The passage into the Ears stands very oddly. In *Dogs*, *Cats*, and most other Land-Animals, forward and outwardly. But here it stands just oppositely, *sc.* behind and inwardly.

The FORE-FOOT of a very great SEAL.

The VIVIPAROUS EEL-POUT. *Mustela marina vivipara*. (the Male, *Lupus marinus Schonfeldii*.) 'Tis well pictur'd by *Adam Olearius*, (a) who calls it a *Sea-Wolf* (*Ein See-Wolf*). As also by *Johnston*; but not described. But in *Gesner's Paralypomena* 'tis both figur'd and described by *Ge. Fabritius* under the Name of *Klipfisch* (*i.e.* Rock-Fish,) so called by the people near the *Baltick* (where he breeds.) *Fabritius* is particular only as to the Teeth, and is also mistaken in some things. I shall therefore add the Description I drew up before I met with his.

(a) Tab. 27.
f. 2.

'Tis a yard long. The Head $\frac{1}{2}$ a foot long, and almost as high; being compress'd on the sides, three inches and $\frac{1}{2}$ over underneath, her Forehead but a little above two. Her Snout a little Convex. The Eyes very high, an inch long. The Nostrils before the Eyes $\frac{1}{4}$ of an inch. Both the Chaps blunt-angled before, from the Corners of the Mouth three inches long, between the Corners, as much.

The Teeth all very thick, like those of *Quadrupedes*; both in figure and scituation, very unusual. In the upper Jaw, five before; not Incisors, or Cutters, but thick Punchers. To the Roots of which, within side, grow as it were nine little Teeth. Behind, are three Grinders; one
of

of which, on each side, is fasten'd obliquely inwards, half an inch broad, and above an inch long. The third, and the greatest, stands betwixt them in the middle of the Palate. Each of these having deep Incisions, seem, as it were, eight or ten Teeth. In the under Jaw, are two Punchers or Claviculars, each of them having two sharp Processes within side. Behind, there seems to be only one Grinder on each side, half an inch broad, and above two inches long, arched inward, and with sixteen or eighteen Incisions looking like so many Teeth.

Her Gills open almost from the top of her Head to her Throat. The Fins are four. The Gill-Fins about five inches long, and as broad, placed so low, as to meet in the Breast, and so to supply the Breast-Fins. The Back-Fin is extended from Head to Tail; before, an inch high; behind, above two. The Belly-Fin reaches from the *Anus* (which opens a foot behind the Head) to the Tail, about an inch deep. The Body, where highest, above $\frac{1}{2}$ a foot, the Back a little convex, grows slender all the way to the Tail, the extremity whereof is here wanting. She is cover'd with a tough Skin, now of an Iron-colour, besprinkled all over with round spots.

That which is most remarkable in this Fish, are his Teeth: which are so made, as to be fit either for Ravine, or for the eating of Grass and other Herbs on the Rocks, and under Water. They seem also to be made for the Cracking of Shell-Fish. As likewise for Ruminations: which may as well be ascrib'd to this Fish, as to the *Scarus*.

This Fish is one, amongst divers other instances of *Aristotle's* error, where he saith, 'Οι δὲ ἰχθύες πάντες εἰσὶν ἀρχαρόδοντες, πλὴν τῶ ἐνὸς τῶ καλεσμένου Σκαῦ. (a)

(a) De Part.
Anim. l. 3.
c. 1.

The tops of this Fishes Grinders are commonly sold for *Toadstones*. As Dr. *Christopher Merret* hath also observed in his *Pinax*.

The SCATE, or Angel-Fish. *Squatina, five Angelus Marinus*. The figure in *Johnston* is tollerable. But the Description very short and imperfect. That of *Rondeletius* is better, yet not full. And either the Fish he describes is a different Species, or his Description of the Teeth is not true.

This is above an Ell long. His Head about $\frac{1}{4}$ of a yard long,

long, and near as much over, (here) with several Angles or Ridges: His Mouth five inches over, his Lips almost Semilunar.

Each of his Jaws are armed with about fix and thirty Rows of most sharp Teeth; and in every Row there are four Teeth. So that in all they are about two hundred four-score and eight, all couched a little inward.

About three inches behind his Nose-end stand his Eyes, as it were on the top of his Head, and three inches and $\frac{1}{2}$ distant. Proportionably very small, *sc.* not above $\frac{1}{2}$ an inch over. About an inch and quarter behind his Eyes, and a little lower, he hath two Spouts, one on each side, above an inch long, and convex before. His Neck $\frac{1}{2}$ a foot over. His Back before, three inches above a foot, expanded (here) on both sides, as if it were shoulder'd. His Middle or Waist about eight inches. The lower part of his Back, ten inches, spread like a pair of Buttocks. From his Shoulders to the bottom of his Buttocks about a foot and $\frac{1}{2}$. The length of his Tail, as much: the forepart whereof above four inches over, growing slenderer all the way to the end.

He hath seven Fins. His Shoulder-Fins with Cartilaginous Rays, expanded $\frac{1}{2}$ a foot out like a pair of Wings, and almost square. His Buttock-Fins prolonged hinderly $\frac{1}{2}$ a foot, stand contiguous to the Tail on both sides. On the top of his Tail, two lesser; three inches high, and couched backward. At the end a forked one $\frac{1}{2}$ a foot long, and almost as high. From hence half a foot forward, the Skin is as it were pinched up into a little Ridge or Doublet on each side.

Above he is very rough with innumerable small Prickles, especially felt upon drawing your hand forward. And the edges of the four side-Fins are all thorny. But underneath the Skin is so thick or closely cover'd with little hard round knobs, as it seems almost smooth.

This Fish hath two Spouts, like the Saw-Fish, because of the breadth of his Head. His Teeth admirable for taking sure hold of the most slippery Prey. Those Doublets on the sides of his Tail, seem to add strength to the *Muscles* which move the Tail-Fins. And so in some other Fishes. By the posture of the Fins he seems to make at the Prey, not by a forward stroke, but by ascending as a Dog to his
O Meat,

Meat, or descending as a Hawk when she stoops. With the broad Fore-Fins, saith *Oppian*, the Female shelters her Young, as a Hen her Chickens with her Wings. But *Aristotle* affirms, That she gives them protection as doth the Dogfish, by receiving them into her mouth. He also saith, That of the Cartilaginous kind the *Scate* only beareth twice in a year, *sc.* Spring and Fall.

(a) Histor.
50.

Salvianus (a) saith, That the Skin of his Back is smooth; deceived by the Authorities of *Aristotle*, *Epicarmus*, *Athenæus*, and *Pliny*: witnesses enough to prove an Error. The Skin of this Fish is used for the polishing of Wooden and Ivory Works. He is taken, saith *Mr. Ray*, sometimes near *Cornwall*.

Another SCATE. 'Tis a young one, but in shape altogether like the former, saving that the Shoulder-Fins are here produced, more like a Wing, into a sharp Angle before.

The HEAD of a SCATE, about the bigness of that above described. Sometimes they grow to the weight of a hundred and sixty pounds.

The HEAD of the GREAT MAID. *Caput Rajæ Oxirrhyrachæ majoris*. See the Description of this and the other Kinds in *Rondeletius*, and *Bellonius*. They all differ from other Fishes, in having a broad and squat Body, with a long slender Tail appendent, but not so slender, as in the *Cat-Fish*. The end of the Snout in this, is all beset with little sharp Hooks pointing backward. And with the same Hooks, both the Jaws: but far bigger, and standing in several Rows, eight, ten, or twelve in a Row.

The Skin of the *Raja*, being artificially reduced to a monstrous shape, is by some shewed, and is commonly taken, for a *Basilisk*.

The EGG of a THORNBACKE. *Ovum Rajæ Clavatæ*. Or rather the Bag or Case of the Egg. Hereof see *Rondeletius*. 'Tis very smooth, and (now) black and horny. Seven inches long, and four over. From each of the four Corners is stretched a sharpe ended Membrane two inches long. In the middle it swelleth up on both sides: so that in shape 'tis just like a Pulpit-Cushion. There are some other lesser ones of the same shape and colour.

In the upper part of the Womb, saith *Rondeletius*, are a great number of Eggs of several sizes, consisting only of

of a Yelk, as in the *Ovary* of a Hen. These successively ripening, are found in the lower part, consisting of Yelk and White, and cover'd with the said horny Case. Out of every one of these mature Eggs, another *Fætus* is also successively generated. Whereby it is intelligible, How this Fish produceth but one at once, and yet so numerous a breed.

The SKREW-GUT of the RAJA, described by *Steno's* Son. Sent by Dr. *Swammerdam* with some other particulars mention'd in the first Section. It winds between parallel lines like a Screw or Stair-case.

The knobbed TAIL of a THORNBAC. Of an ash-colour, and about a yard long.

The spiked TAIL of a THORNBAC, almost black. The knobs of both are so hard, that they will file Iron or Brass. The Skin of this Fish is used for Knife-hafts, &c.

The smooth CAT-Fish. *Pastinaca marina lævis*. *Fabius Columna*, (a) hath described two Species of this kind: but both of them seem to be different from the Fish here. It is somewhat phantastically stuffed; yet I shall give the Description as well as it will admit.

(a) Lib. de
Aq. & Ter-
rest.

From the tip of his Snout, to his Tail, a foot and three inches, about a foot over, and $\frac{1}{2}$ a foot (being, I suppose, thrust out somewhat more than the natural dimension by the stuffing) in height. His Eyes $\frac{1}{2}$ an inch long, two and $\frac{1}{2}$ inches distant, three and $\frac{1}{2}$ behind his Nose-end. Just behind his Eyes, and a little more distant, he hath two Spouts, one way, an inch and $\frac{1}{4}$ over. His Snout prolonged forward an inch and $\frac{1}{2}$ with an Obtuse Angle; and extended towards the side-Fins, wherewith it is also joyned by the mediation of a Skiny-Border $\frac{1}{2}$ an inch broad. His Mouth very little, not an inch and $\frac{1}{2}$ over; curiously rough-cast like a file, underneath, and behind his Snout-end two inches and $\frac{1}{2}$. Over his upper Chap hang two little Labels above $\frac{1}{2}$ inch long.

His Gills are five on each side, but towards the middle of his Belly. He hath four side-Fins. His fore-Fins are stretched out two inches in breadth, extended in length towards the Tail, almost a foot. The hinder-Fins are almost two inches broad, and above an inch and $\frac{1}{2}$ long.

The Tail a foot and two inches long, at the Root about an inch and $\frac{1}{2}$ over, the extremity very small like a *Shoemaker's* Thread. The Skin not very thick, nor stubborn, (now) of a yellow colour on the back, on the Belly straw-colour'd: every where very smooth, excepting on his Tail, where there are some few very short prickles.

Whether this be not a young Fish, and upon that account only wanteth the *Radius* (as the sharp Saw upon the Tail is called) to me is uncertain. With this *Radius* he is said to strike and kill his Prey, for which he lies as it were dormant, till it swims within his reach. *Ælian*, cited by *Rondeletius*, saith, That he sometimes flies. Which that he may do a little above the water, as the flying Fishes, seems possible by the horizontal production of all his Fins, and their extension all along his sides.

The *Chineses* and *Moors* eat this Fish greedily.

The nether LIP of the smooth CAT-FISH, two inches long.

The BRASILIAN FROG-FISH. *Rana Piscatrix minor*. In *Brasile*, GUACUACUYA. The figure which *Johnston* gives is tolerable; but his Description very defective. The length of this is eight inches. His Mouth open makes a Circle $\frac{3}{4}$ of an inch over. His Lips, in the usual place of Teeth, are rough; as also is his Tongue. He hath a black Horn on his Forehead, stooped forwards, round, an inch and $\frac{1}{2}$ long, one third over at the bottom, pointed, and having little Spikes round about it. What *Johnston* means by the *Cuteus Nervus*, appears not. At the top of his Head, just under the Horn, stand his Eyes a $\frac{1}{4}$ of an inch over, and (here) no more distant. The Nostrils a little before the Horn.

His Body two inches and $\frac{1}{2}$ long, and four broad; before, *Semilunar*. His Back convex, his Belly flat; with a Border or Fin all along each side $\frac{1}{2}$ an inch broad. Behind are subjoyned a pair of Fins almost two inches long, and an inch and $\frac{1}{2}$ wide. In the middle of his Belly are two other lesser close together, above an inch long, but not more than $\frac{1}{4}$ broad.

The length of the Tail four inches and $\frac{1}{2}$. At the root 'tis round, and an inch over; at the end, with the sides compressed, and $\frac{1}{2}$ an inch high. The Tail-Fins three, one above,

above, another just under it, the third at the end much bigger. The Skin of his Belly and Tail underneath, whitish, thin, and rough. Of his Backside, Fins, and Tail above, black, thick and set with short spikes arising from a round Base radiated like a Star. He seems, by his shape, to be near of kin to the *Thornback*; and therefore to be less appositely Nam'd.

A lesser *Brasilian* Frogfish of the same kind.

The TRUMPET-FISH. So called from the figure of his Bill, which is an entire Pipe, shaped almost like that of the *Snipe-Fish*. *Acus Aristotelis*. Well described by *Rondeletius*; saying, that he describes the Body to be *Sexangular* all along. Whereas from the Head to the *Anus* it is *Septangular*. The Scales are also engraven with small lines almost of an Elliptick figure. *Salvianus* errs in saying he is not scaly. Another also of the same *Species*.

The Female, saith *Rondeletius*, hath a *Canale* extended from her *Anus*, in which the Eggs are hatched into young Ones. Of the use of the Bill, see the *Snip-Fish*.

The lesser TRUMPET-FISH, or Viviparous Needle-Fish.

The HORSE-FISH. *Hippocampus*. A small Fish. So called, because his Head is shaped like a Horse, and his Tail divided by several Incisures, somewhat like those of *Caterpillars*, called *χιμαια*. Given by Mr. Scotto a London Merchant. It hath the same number of Fins, and in the same place, the same kind of Bill, the fore-Body *Septangular*, and the Tail square, as the *Trumpet-Fish*. And is, therefore probably, also Viviparous: and so I have ventur'd to place it here.

Another HIPPOCAMPUS taken in the *Mediterranean*.

A STURGEON. *Acipenser*. *Sturio*, because one of the greatest of edible Fishes; for *Stur*, in the *Danish-Tongue*, signifies Great. (a) See *Wormius* his Description. Especially (a) *Wormius*. The like in *Besler*. The parts by which he is best distinguished, are his very long and sharp Snout, his little Mouth, to be seen only when he lies on his back, and his thick and bony Scales; which stand in Rows so, as to make the Fish almost *Pentangular*. The figure of most of the side Scales is

(a) L. de Re is *Rhomboidal*. It is affirmed by *Moufet*, (a) That the Scales of a *Sturgeon* turn towards the Head; borrowing his Error herein of *Pliny*.
Cibaria.

Lately, a piece of a *Sturgeons* Gut was shewed me by Dr. *Edward Tyson*, which he had cut off of a great One sent to my Lord Major. It is very thick, strong and *Muscular*. And the inner Coat made of *Fibers*, so loosely woven together, as to look like a Net; and that above the eighth of an inch in thickness. In which a plenteous Chyle is conveniently lodged, and thence gradually transmitted to the Lacteal Veins.

(b) Exerc.
182. S. 2.

Scaliger saith (b) of the Guts of a *Sturgeon*, that being taken out and cut all to pieces, those pieces will still move. Which may partly depend upon their great thickness and muscularity; the like being observable in cutting the Heart and other *Muscular* parts of divers Animals.

(c) Salvian.

The *Sturgeon* is taken in most great Rivers, as well as in the Sea. He hath sometimes been seen, saith *Bellonius*, six yards long. The bigger he is, as all other Fish, the better meat. The *Italians* (c) prefer the Belly before the *Jole*. His Liver very delicate. At *Hamburge* and *Dantsick* they eat (or did in *Moufet's* time, who reports it, eat) *Sturgeon* roasted. In the same Author, see a most excellent Pickle for this Fish. The Eggs being salted and made up into a Mass, were first brought from *Constantinople* by the *Italians*, and called *Caveare*. Of the way of making it, see *Gesner*. The pickled pieces made of the *Chine*, are by some called *Schinalia*. Of the long Bag (d) which grows next the *Chine*, the people that live near *Tanaïs* make Glew.

(d) Salvian.

The HEAD of a great STURGEON.

MOON-FISH. *Mola Salviani Luna*; Because the Tail-Fin is shaped like a *Half-Moon*, By which, and his odd trussed shape, looking as if he were only the Head of some great Fish cut off from his Trunk, he is sufficiently distinguished from all others. Well described by *Rondeletius* and *Salvian*; and by this latter, very curiously pictur'd. The Gill-Fins, as he observes, are so postur'd, as not to move from Head to Tail, or *vice versa*, but from Back to Belly,

Belly, & *è contra*. The use whereof seems to be, To enable him to make a more direct and sudden descent; that so when any Ravenous Fish makes full speed at him, he may in an instant strike himself under his way, and so escape him. It may also be noted, That being a tall Fish, and with his sides much compressed, he hath a long Fin upon his Back, and another answering to it on his Belly: by which he is the better kept upright, or from swaging on his sides.

Another MOON-FISH of the same Species, but somewhat lesser. Neither of these is above $\frac{1}{2}$ a yard long. But that which *Salvian* describes, was above an hundred pounds weight. They are taken, as Mr. *Ray* saith, about *St. Ives* and *Pensans* in *Cornwall*.

CHAP. II.

OF OVIPEROUS FISHES, particularly
such as are NOT-SCALED.

THE HEAD of the RIVER-WHALE. *Caput Siluri*. *Johnston* gives the figure of this Fish, but without a Description. That of *Rondeletius* is not full. This Head is $\frac{1}{2}$ a foot long, as broad, and half as high. The Snout flat. Both the Chaps before of a *Semilunar* figure. Armed with an innumerable company of prickly Teeth, standing like those in a *Card* wherewith Women Comb Wooll. The nether Chap stands out above an inch before the upper. The Eyes round, and for such a Head, very small, scarce the third of an inch over. Distant three inches and $\frac{1}{2}$. An inch above the corners of his Mouth, he hath two strings, smooth and round, here (for they are broken) $\frac{1}{2}$ a foot long, about the thickness of an *Earth-Worm*, taper'd and bended backward; outwardly nervous, inwardly Cartilaginous or Grisly. His Gills descending almost from the top of his Head, meet under his Throat.

What may be the use of these strings is uncertain, and to be collected only from observing their communication with other parts, and the manners of the Fish. But the
intent

intent of their structure is less obscure; the Nervous part serving to draw it too and fro; the Cartilage, as the spring in a *Pendulum* Watch, to stint the motion and make it more steady. And being flexible, it does the same as a joynted Series of many little Bones.

The little SEA-UNICORNE. *Monoceros minor*. It was sent from *Brasile*, I find it not described nor pictur'd in any Author. Nor is it certain whether it be Oviparous. Yet I have ventur'd to place, and shall describe it here.

'Tis $\frac{1}{2}$ a yard long, almost $\frac{1}{4}$ high, with its sides very much compressed, being not above two inches and a $\frac{1}{2}$ over. High-Bac'd, like a *Perch*. And also (which is unusual) bow-Belli'd. His Head hath some resemblance to that of a *Baboone*; from the top to the bottom four inches and $\frac{1}{2}$. His Mouth, which stands below, not much above an inch over. His Teeth, in both Chaps, the thickness of a midling Needle, the eight of an inch long. His Gills subtended to his Eyes and Mouth like the segment of a Circle. His Eyes stand near the top of his Head; and are an inch over.

From the top is prolonged a smooth (now) blackish, round, taper'd, strait Horn, couched a little down below the level, two inches round about the Root, and three inches long. It seemeth not to have any Bone within it; nor is it inserted into any, as in the *Unicorne* of the Cetaceous kind before described; but is the Skin it self prolonged and hardened (as the *Cuticula* turns to *Cornes*) into a kind of horn.

The Fins are seven. The Gill-Fins two inches long, and one broad. The Back-Fin is extended from Head to Tail, above an inch and $\frac{1}{2}$ high. The Breast-Fins $\frac{3}{4}$ of an inch before the *Anus*, near two inches long. The Belly-Fin, like that of the Back, and extended from the *Anus* to the end of the Tail. That at the end of the Tail *triangular*, two inches and $\frac{1}{2}$ long, three high. The *Anus*, if you measure by a perpendicular from the Gills, opens, oddly, not above an inch and $\frac{1}{2}$ behind them. He is cover'd with a (now) blackish, thick and tough Skin, and when you draw your hand forward, also rough.

The SHIPHALTER. *Echeneis. Remora*. Johnston hath given

given an indifferent figure of it. But I meet with no tolerable Description any where.

'Tis about $\frac{3}{4}$ of a yard long. His Body before, three inches and $\frac{1}{2}$ over; thence tapering to the Tail-end. His Mouth two inches and $\frac{1}{2}$ over. His Chaps ending somewhat angularly. The nether a little broader, and produced forward near an inch more than the upper. His Lips rough with a great number of little prickles. His Eyes round; $\frac{3}{4}$ of an inch over, an inch behind his Mouth.

His Head squat, adorned with a kind of Oval *Coronet*; somewhat Concave, five inches and $\frac{1}{2}$ long, above two broad, cut traversly with three and twenty Incisions or long Apertures, making so many distinct Membranes, with rough edges, joyned altogether with a Ligament running through the middle of the *Coronet*, and perforated on each side the Ligament.

The Gills wind from an inch and $\frac{1}{2}$ behind the Eyes down to the Throat. The Fins seven. The Gill-Fins above four inches long; The Breast-Fins as long. About a $\frac{3}{4}$ of a yard behind the *Coronet* a fifth extended on the Back above $\frac{3}{4}$ of a yard. A sixth like it on the Belly. The Tail-end, like a Spear, a little compressed. The Tail-Fin three inches and $\frac{1}{2}$ long. The *Anus* open about the middle of the Fish. His Skin is (now) brown, smooth, and tough, or like tan'd Leather.

Perhaps the same Fish, which *Ligon* (a) saith, always swims along with the *Shark*, and frequently sticks to some part about his Head. At least, it is very probable, that this Fish is able to fasten himself to any great Fish, Boat, or Ship, with the help of the *Coronet* or *Sucker* on his Head; which seems to be most fitly contrived for that purpose. In some sort answerable to the Tail of a *Leech*, whereby she sticks her self fast to the smoothest Glass. Or to those round Leathers, wherewith Boys are us'd to play, called *Suckers*, one of which, not above an inch and $\frac{1}{2}$ diametre, being well soaked in water, will stick so fast to a Stone, as to pluck one of twelve or fourteen pounds up from the ground.

Of the stupendious power which this Fish is supposed to have, there are many concur in the story; as that he is able to stop a Ship in its career under full Sail: and what not?

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and

(a) Hist. of Barbadoes.

and great pains is taken to assign the Cause; and to prove, That though the *Moon* be made of a *Green Cheese*, yet is not the only Nest of *Maggots*. *Rondeletius* alone, in ascribing it to his easily altering the position of the Helm, and so the motion of the Ship, coming near to good sense: especially if he had proved, That the Name of the Fish, and the Story, were not Things much older than the Helm of a Ship.

'Tis plain, that the Tradition had a very early beginning; when little light Boats were the Ships which people us'd. To the side whereof, this Fish fastening her self, might easily make it swag, as the least preponderance on either side will do, and so retard its Course. And the Story once begot upon a Boat, might still, like the Fish it self, stick to it, though turn'd to a Ship. Assigning as great a power to this *Neptune* in the Sea, as the Poets have done to *Apollo* the God of Life in the Heavens; who yet appears by the best accounts of him put together, to have been at first no better than a Crafty *Mountebank*.

The TOBACCOPIPE-FISH. By the People of *Brasile*, and by *Marggravius* who describes it, called *Petimbuaba*. He hath only omitted the Line, which, like a very small Chain, runs along both sides, as in the *Sea-Scorpion*, from Head to Tail: Both the Body and Snout are long and slender, from whence its Name. 'Tis also pictur'd, and in some sort described by *Piso*.

The PRICKLED TURBUT. *Rhombus aculeatus*. So called from his figure and the prickles on his Back or brown side. Described by *Rondeletius*. The two strings that hang at the nether Chap, are here wanting. He is said, having hid himself in Mud, with these, to Prey upon little Fish, which seeing them ringle, make at them, supposing them to be Weeds.

The little GLOB-FISH. *Orbis minor*. So called from his Orbicular figure. Described in most *Musæums*. Most curiously figur'd in that of *Calceolarius*. He is armed with long, round, hard, and sharp Spikes or Needles all round about, almost like those of a *Hedg-Hog*; and is a sort of *Porcupine-Fish*.

'Tis probable, That the Fish swims with these Needles all closely couched down round about, for that otherwise they

they would hinder her swimming. But if at any time she is pursu'd, she immediately advances her Pikes, and bids the enemy come at his peril.

This and the other kinds are found, especially, in the River Nile.

The SEA-PORCUPINE. *Histrix Piscis*. *Johnston* hath figur'd it (*Tab. 45.*) but not well. Neither do I find any tolerable Description of it.

This here is above a foot long, near half a foot over, and as high, round, and almost of an Ovale figure. His Chaps about $\frac{1}{2}$ an inch long, shaped somewhat like the Bill of a Sparrow, each of them one single Bone, without any Teeth, but sharp-edged; at the corners of the Mouth an inch over. His Eyes $\frac{1}{2}$ an inch over, an inch behind his Mouth, and two and $\frac{1}{2}$ distant.

The Gills but $\frac{1}{4}$ of an inch long, Convex before, very high, viz. in the same level with the Eye. As also the Gill-Fins, which are about two inches long, and three broad. Two inches and $\frac{1}{2}$ before the end of the Tail, a third an inch and $\frac{1}{4}$ broad and two inches long. An inch and $\frac{1}{2}$ before the end of the Tail underneath, a fourth somewhat less. The Tail-Fin above two inches long, an inch and $\frac{1}{2}$ high, with its extream edge Convex.

He is cover'd with a Skin on the Back (now) of a brownish yellow, on the Belly whitish. Armed all round about, excepting his Tail, with round, hard, and most sharp Needles, about an inch and $\frac{1}{4}$ long, $\frac{1}{2}$ an inch distant one from another, each having three Roots (now) visibly spread under the Skin, one on each side, and a third before.

'Tis most probable, That to these Roots are fasten'd so many Muscles, whereby these little Pikes are govern'd in their motion, and kept steady in their posture of defence.

Another SEA-PORCUPINE like the former.

The FROG-GLOB-FISH. *Orbis Batrachoides*. Figur'd by *Johnston* under the Title of *Gestachtel meer Taube*, *Tab. 24.* But I find it not described to any purpose.

This is seven inches long, three broad, and as high. His Forehead above an inch and $\frac{1}{2}$ over, by the eminency

of his Eye-Brows a little hollow. His Eyes round, above $\frac{1}{2}$ an inch over. His Mouth very broad and femilunar, like that of a *Frog*; from whence I take leave for his Name. His nether Chap a little broad and more forward than the upper. Without any Teeth, but rough like a File. The Gills $\frac{1}{2}$ an inch long, an inch and $\frac{1}{4}$ behind the Eyes. The Fins are five. The Gill-Fins above an inch long, almost as broad. Before the end of the Tail, one above about an inch long, that underneath broken off. The Tail-Fin above $\frac{1}{2}$ an inch long, near as high. The *Anus* opens an inch and quarter before the Tail-end.

He is cover'd all over with a very hard and tough Skin, (now) of a yellowish straw-colour. Armed round about with strong Spikes about $\frac{1}{4}$ of an inch long, couched backward, and fixed with three Roots, as in the former. But not, as those, round, but flat with two edges like the point of a Sword.

It may further be noted of these Spikes, That being fixed in the Skin, both here and in the other kinds, so as to couch and point backward, the fish needs not to tack about, but is at the same time in a posture of defence, and of flight, for its surer escape.

The EGYPTIAN GLOB-FISH. It differs from the rest, especially by the smallness of its Prickles, which are rather like the little Thorns on a young *Rasperry-Bush*. He is not armed with them, as *Rondeletius* saith, all over; the Skin behind the Gills for the length of $\frac{1}{4}$ of an inch, and on the lower part of the Tail, being bald.

The HARE-GLOB-FISH. *Orbis Lagocephalus*. I find it not any where pictur'd or describ'd. 'Tis above a foot long, $\frac{1}{2}$ a foot high, almost five over. His Head almost like a *Hares*, from whence I have Nam'd him. His Forehead plain and almost square, an inch and $\frac{3}{4}$ broad. His Eyes round, above $\frac{3}{4}$ of an inch over, and stand high. Three quarters of an inch before the Eyes, two holes like Nostrils. From thence to the Nose-end a little above an inch. The end above $\frac{1}{2}$ an inch over, and round. His upper Lip stretched thence to the breadth of $\frac{1}{2}$ an inch. Each Chap as it were divided into two great Teeth $\frac{1}{4}$ of an inch broad.

The Gills an inch and $\frac{1}{4}$ long, behind the Eyes an inch,
below

below them $\frac{1}{2}$ an inch. The Fins are five. The Gill-Fins stand obliquely between the Back and the Breast, an inch and $\frac{1}{2}$ long, and three broad. Three inches before the Tail-end, a third almost two inches long and one broad. Underneath, a fourth somewhat less. This, which may be noted, being couched backward, the other foreward. The Tail-Fin two inches and $\frac{1}{2}$ long, and as high, with its utmost edge Convex.

His Skin Membranous and limber, on the top of his Head, Back, upper Sides and Breast, and round about his Tail, smooth and bald. On his Belly and lower part of his Sides and Breast, armed with little short Prickles, about the third of an inch distant, and fixed with little Roots, as in the former.

From the Crown of his Head are drawn two Lines almost to those holes like Nostrils. From the hinder part of the Head, two more all along the Back and Tail, in the figure of the Letter *f*. And two others from the Gill-Fins towards the *Anus*, and from thence to the end of the Tail. By these Lines, were there no other marks, it is easie to distinguish him from all the other *Species*.

An OVAL COMPAGES of BONES, said to be the *Skeleton* of a *Globe-Fish*.

The RED-GOURNET. *Pavo Salviani. Cuculus*, from the noise he makes like a *Cuckow* when he is taken. Well described by *Rondeletius*. But his figure, especially in making him with a long Snout, answers not, unless it be of another *Species*. For the Forehead of this is square, and the Head almost cubical, like that of the *Scorpion-Fish*. From which this chiefly differs in not having the Fins of the Back prickly or spiked, and having a Line running from the top of the Back on each side the Back-Fin to the Tail, like a small linked Chain.

The LONG-SNOURED GOURNET. *Cuculus Rondeletii*. By which Author 'tis well described. It differs from the former *Species*, chiefly, in having a much longer head, and a saddle-Nose.

The STAR-GAZER. *Uranoscopus*. Because he looks directly against the Sky: whereas, as *Rondeletius* observes, the *Ray* and several other fishes, although they have their Eyes standing on the top of their Heads, yet the Pupils of their

their Eyes are not directed upwards, but side-ways. The Fish is accurately described by the same Author. Saving, that he hath omitted the arching or bowing of his Body with the Head and Tail upwards: unless both the shape of the Fish here be forced, and his own figure thereof false.

This Fish, when alive, hath a slender Membranous string, which he projects and draws in, at pleasure, as a *Serpent* doth his Tongue. With this he duckoys little fishes, and then preys upon them. For plunging himself in Mud (*Rondeletius* saith, he hath seen him) and then lifting up his head a little, he casts out the said string; which the little fishes taking for a Worm, and nibbling at it, he immediately plucks them both in together.

The SQUAR-FISH. *Piscis quadrangularis*. I think it is not described or figur'd by any. There are two square fishes described by *Wormius*, the former of which he supposeth to be made so, not bred. But neither is this, as that is, spiked behind; nor as the other, horned before, besides other differences: 'Twas sent from the *East-Indies*.

'Tis about fifteen inches long, four high, in the middle three and $\frac{1}{2}$ over. His Forehead square, by the eminency of the Eye-brows, a little hollow; two inches and $\frac{1}{2}$ over. His Eyes near an inch. His Nose blunt, not very steep, an inch and $\frac{1}{2}$ long. Two small holes in the place of Nostrils. His Mouth exceeding little, $\frac{1}{2}$ an inch over. His Teeth also very small.

The Gills are strait, an inch and $\frac{1}{2}$ long. His back a little Convex; towards his Tail, and on his sides blunt angled. So also his Belly, but plain or flat; and considerably rising up towards his Tail. He hath five Fins. The Gill-Fins are two inches in length, and two in breadth. They stand a little obliquely. Like these, a little before the Tail, one above, another under. The Tail-Fin three inches long, and three and $\frac{1}{2}$ high.

Some part of both the Chaps and of the Tail are cover'd only with a Skin. The rest of the fish with a kind of Crust: yet not altogether so hard as in the Crustaceous kind. This Crust is all over adorned with innumerable little round knobs reduced, for the most part, into hexagonal figures, subdivided into equilateral Triangles.

Wormius

Wormius calls this Crust a Leathery Skin: but not rightly; as any one that compares it with the true Skin upon his Chaps and Tail, whereof he takes no notice, may easily judge. That it may be bent, proves it not a Skin; for so may the Crust of a *Lobster*. To which this seemeth to stand in the next degree, as that doth to a shell. Or to speak properly, it seems neither a Skin, nor a Crust alone; but a Medly of both together, or a Crust upon a Skin: Nature having here, as in many other examples, united two extremes by a third Thing in the middle.

Another SQUARE FISH stained with black Spots. Given by Mr. *John Short*.

The CONEY-FISH. *Piscis Triangularis*. Described by *Marggravius*. *Wormius* also supposeth his first Square-Fish to be the same. But neither of them are particular enough.

'Tis above $\frac{1}{2}$ a yard long, above $\frac{1}{2}$ a foot high, the Belly flat, and almost $\frac{1}{2}$ a foot over. From whence his sides rise up into a sharp Angle. His Head somewhat like that of a *Coney*; from whence his Name. His Eyes great, *sc.* an inch and $\frac{1}{2}$ long; and stand high. His Forehead almost square, and by the eminency of the Eye-brows a little hollow; an inch and $\frac{1}{4}$ broad. Half an inch before the Eyes two little holes like Nostrils. His Nose descending almost perpendicularly, three inches deep, and blunt-ended. His Mouth not above an inch over. The Teeth $\frac{1}{2}$ of an inch long, and sharp: ten in the lower Chap, in the upper twelve. His Back arched between the Head and Tail, and, as is said, very sharp. On each side his Belly he hath a strong sharp Spike $\frac{1}{2}$ of an inch long, standing near, and pointing toward his Tail.

His Gills are strait, above an inch long, and parallel to his Nose. The Fins five. The Gill-Fins here broken off. A little before his Tail, one above, another below, both two inches long, an inch and $\frac{1}{2}$ broad. The Tail-Fin three inches long, and two and $\frac{1}{2}$ high. Excepting his Chaps and Tail, which are naked, he is cover'd all over with the like Crust, as the former. On the upper part of the Tail, also grows a distinct Crust, of an Oval figure.

The Chaps and Tail of this Fish, and the rest of the kind, are both left naked, for the more easie and convenient motion

motion of the one in eating, and of the other in swimming. And for the same reason, the Gill-Fins do also stand upon a naked Membrane.

The Female-CONEY-FISH. The Nose here descendeth not so steeply. The Belly not so broad. The Crust every where, except the middle of the Belly, stained with a great number of round black Spots. Hath not many of the triangular subdivisions. Nor the Oval Crust upon the Tail.

Another of the same *Species*, with that now described.

The HORNED CONEY-FISH. *Piscis triangularis*
(a) Tab. 45. *cornutus*. Johnston hath figur'd it. (a) But without either Description or Name. It differs from the fish last described chiefly by its Horns, which he hath upon the top of his Forehead, $\frac{1}{2}$ an inch long, near an inch about the bottom, and pointed; almost like an Horses Ears when he pricks them forward. His Teeth are also smaller, his Mouth lesser, and more naked. His Belly narrower, and so his sides more compressed. The Tail-Fin longer. And the Oval Crust on the Tail, not above but beneath.

ANOTHER of the same *Species*, with two Oval-Crusts, one on the top of the Tail, the other underneath.

A THIRD, without the said Oval-Crust, and the triangular subdivisions.

Two more HORNED CONEY-FISHES. All five of one unmixed ash-colour.

CHAP. III.

OF SCALED-FISHES.

THE HEAD of the CUCUPU-GUACU; so called by the people of *Brasile*, where it breeds. Described by *Marggravius*. Who saith it is sometimes two yards long, and a yard and half about. The Mouth of this Head standing quite open, makes a circle of a yard in compass. So that, probably, 'tis the biggest of *Scaled-Fishes*, excepting

excepting the *Sturgeon*. Of all our *European* Fishes, it seems to come nearest to the *Cole-Fish* or *Black-Cod*.

The *SCALES* (perhaps) of the same Fish. They are almost circular, above three inches in Diameter, and answerably thick. Like other Scales, they are horny, transparent, and elastick or springy. That part of their edge which is inserted into the Skin, bluntly Toothed. They have a great many exceeding small *Striæ*, hardly visible, but by holding them up against the light.

The *FILE-FISH*. *CAPRISCUS*. It was sent from the *Bermudas*. Curiously pictur'd and described by *Salvian*. (a) *Hist.* 718 I call it the *File-Fish*, from the likeness which the foremost Bone upon his Back hath to a file. There are three of them: which, saith *Salvian*, he raises and depresses at his pleasure; yet so, as not one alone, but altogether. And although you press the foremost, and greatest never so hard, it will not stir: but if you depress the last and least of all never so softly, the other two immediately fall down with it: just as when a *Cross-Bow* is let off by pulling down the Tricker. For which reason also the fish is called, at *Rome*, *Pesce Balestra*.

Another thing peculiar to this fish is, that his Scales (as *Salvian* calls them) are separated by cancellated lines, or Lattice-wise. I add, and that they are all incrustated, and rough-cast with little round knobs. So that the cover of this fish, is near a kin to that of the *Square-Fish*; that being only one entire *Crust*, this divided into many little ones.

It may be noted, That where *Salvian* describeth this fish to be *compressum & latum, atq; fere orbicularem*, he hath not properly expressed his shape. For he is not *Broad*, but *Tall*; and much nearer to a *Rhombus* or *Diamond-square*.

This fish seems to be the same which the People of *Brazil* call *GUAPERUA*; described and pictur'd by *Margravius* and *Piso*, and out of them by *Johnston*. (b) *Tab.* 34

The *TALLEST FILE-FISH*. This seems to be that *Species* particularly described by *Salvianus*. It differs from the foregoing only in being taller and narrower: and in having the Tail-Fin with longer horns.

The *PRICKLE* or longest *FILE-FISH*. It is a young One.

One. Differs from that of *Salvian*. In that on the sides hinderly, grows a little short Prickle upon the centre of every Scale, pointing backward. It is also ratably much longer and lower, his Nose a great deal shorter, and less steep, and his Tail-Fin less spread.

Another LONG-FILE-FISH of the same *Species*, and about a foot in length. But the Prickles above-said are here worn off.

The STREAKED FILE-FISH. *Capriscus striatus*. This differs from the last, In that its Scales are not prickled, but streaked with many small Lines; forward, entire; but hinderly composed of many little knobs.

The SNIPE-FISH. *Scolopax*. It was taken in the *Baltick-Sea*. I find it no where well described.

It is a little fish, when at full growth, as *Rondeletius*, who had seen three of them all small, and full of Eggs, well observes. This here, about three inches and $\frac{1}{2}$ long, $\frac{3}{4}$ of an inch high, the sides much compressed, being not $\frac{1}{4}$ of an inch thick. The *Orbits* of his Eyes very great, *sc.* a $\frac{1}{4}$ of an inch over. His Forehead as much.

He hath a tubular or pipe-like Snout, resembling that of the *Hippocampus*, or the *Horse-Fish*. It consisteth of only one hollow Bone, strait, and from his Eyes above an inch long, or one third of his whole length. At the root, above $\frac{1}{4}$ of an inch high; at the extremity, $\frac{1}{16}$. Where he hath an exceeding little Mouth; which openeth not before, but above.

His Gills large, behind the Eyes $\frac{1}{2}$ of an inch, from whence carry'd to his Snout or Bill, they describe $\frac{1}{4}$ of a circle. The Fins four. The Gill-Fins almost $\frac{1}{2}$ an inch long, in the same level with his Mouth and the bottom of the Eye. The Tail-Fin as long, $\frac{1}{2}$ of an inch high. Before and above the Tail a fourth, a $\frac{1}{4}$ of an inch long, $\frac{1}{2}$ broad.

A little before this Fin, stands a white and very sharp *Spike*, or *Saw*, above an inch long, couched a little backward, and armed with a double row of small sharp Teeth, all pointing upward. To this great One, are subjoyned two lesser, by one common Membrane, as in the *File-Fish*.

His Skin grey with some few rays of red; possibly more
in

in the living fish. He is scaly, and rough with a single Row of very small Prickles near his Eyes, with a treble one on his Belly and Sides; hardly visible without a Glass.

By the great length and structure of this Fishes Bill, he should seem, upon dilating his Throat at his pleasure, to suck in his food, and so to use it as a *Syringe*. Withall, his Mouth not being open before, but on the top of his Bill-end, like a Gutter-Trough, doth much promote the current, of all that comes in at it, to his Throat. And so in the *Trumpet-Fish*.

The three Spikes on his Back (whereof *Rondeletius* and others only observe the greatest) being associated in the same manner, and having the like mutual proportion, as in the *File-Fish*; it may reasonably be supposed, that they have also the same Motions, depressions and erections, as, in speaking of the said fish, hath been described. And that therefore, while the fish swims secure, they are all couched down close to his Back, that they may not hinder his course: but that when ever he is pursued, he strait erects them all, and by the help of the lesser, keeps the great one tite up against his Enemy.

The **SQUARE ACARAUNA**; by Mariners, *The Old Wife*. It hath some marks of kindred with the tall *Acarau-na*, described and pictur'd in *Marggravius* and *Piso*. But hath also divers others of distinction from it; as the different position of the *Spurs*, the different shape both of Head, Body and Tail, &c. as may be observed by comparing the Descriptions and Figures of both together. The tall *Acarauna* is figured also by *Johnston*, (a) out of *Marggravius*; (a) Tab. 32. but without any Inscription of Number or Title.

This here was brought from *Suranam*. Eight inches long and $\frac{1}{2}$, above three high, about one and $\frac{3}{4}$ over. His fore parts and Tail are (now) of a pale straw-colour; all the rest are of a blackish brown. He is cover'd all over with Scales engraven with small parallel Lines: except on his Forehead and Chaps before, where his Skin is only ruged as you draw your Finger downward.

The Crown of his Head rises up into a blunt Angle, his Forehead flat, above $\frac{1}{2}$ an inch broad. His Eyes round, $\frac{1}{2}$ an inch over, and stand high. A little before them, two small holes like Nostrils. His Mouth also stands high, and

is extreme small, scarce $\frac{1}{2}$ of an inch over. His Teeth contiguous, like small Needles.

On his upper Jaw grow four little Prickles on each side. On each side his nether, two great *Spikes* or *Spurs*, hard, and very sharp, about an inch long, pointing obliquely downward, and bended a little like a *Cocks Spur*. From the Root of these several little short Prickles run in a strait Row to the Eyes.

The Gills behind make a strait Line, and an Angle, from whence they are produced forward. The Fins seven. The Gill-Fins hang under the *Spurs*, an inch and $\frac{1}{2}$ long near an inch broad. The Breast-Fins also an inch and $\frac{1}{2}$ long, $\frac{1}{2}$ broad. The Back-Fin from the top of his Head, the Belly-Fin from his *Anus* are carry'd to the Tail-Fin, so as to stand betwixt two parallel lines, making the fish almost square; from whence I have Nam'd it. They are both stretched out beyond their roots with two sharp Angles. The Tail-Fin an inch and $\frac{1}{2}$ long, and higher, with its utmost edge Convex.

The *Spur* above describ'd, is a dangerous, and as it seems, a malicious Weapon; wherewith the fish strikes side-ways, and as it were under-hand, not suffering, in its doged humor, any other fish to consort with it.

The SWALLOW-FISH. So called from the length of his Gill-Fins, which reach to the end of his Tail, like a pair of very long Wings. By some, the *Flying-Herring*; from a likeness in the shape of their Body. Perhaps *Rondeletius's Mugilis Alatus*. But by *Salvian* called *Hirundo*, by whom it is well described. (a) That Line (saith he) which in other fishes goes either from the Head or *Branchiæ* by the sides to the Tail; here runs from the Belly-Fins along the Belly to the Tail. *Johnston* also describes it out of *Aldrovandus*, but omits the just number of seven Fins. In the figure also which he gives, the Belly-Fins are wanting. And the *Orbits* of the Eyes, which are extraordinary great, he representeth little.

His Gill-Fins he useth as Wings, wherewith he flyeth, for escape, above the water, when pursu'd by another fish; especially, as *Piso* saith, by the *Dolphin*. But as they fly (as the same Author) they often become a prey to *Water-Fowl*. Hundreds of them are sometimes seen above the
Water

(a) Histor.
62.

Water at once. When they fly, they make a kind of *Stridor*, as some Fowls with their Wings.

KITE-FISH. So called also from his Wings or Gill-Fins, which, what they want in length, they have in breadth and strength. Figur'd by *Rondeletius*, and accurately described. Saving, that he mentions but seven of his eight Fins.

This fish seems to be the same with that which *Marggravius* describes by the Name of PIRAPEBE.

Another KITE-FISH of the same *Species*. Figur'd by *Johnston*, *Tab. 17. N. 9.*

Of the GILL-FINS of the FLYING-FISH, it is further observable, That they are fastened very high near their Backs; that so at the same time their Bodies may be in some part sustained by the Water, and their Wings have a little scope to play above it, for their easier advance into the Air.

The BEARDED-LOACH or GROUNDLING. *Gobites Barbatula*. It is a small fish about five inches long, bearded with six small Threads, three on each side. Yet *Bellonius* mentions but four. Nor doth *Gesner* picture more in his corrected figure. See them both.

The MAILED-FISH. *Cataphractus Schonveldii*. It was brought from *Guiny*. But is also often taken in the Mouth of the *Elb*. It is well described by the Author of the Name. And by *Johnston* well figur'd, *Tab. 46.* But in *Tab. 24.* but scurvily, unless it be another *Species*. It is a small fish about five or six inches long, with a broad squat head, and thence taper'd to the end of the Tail. His Scales are as it were doubled, by which he becomes of an angular figure, with about eight Angles before, and six behind. His Nose-end armed with two Prickles standing together in a semilunar figure; supposed to be venemous.

The TAMOATA pictur'd and described by *Piso*, seems to be the same with this fish.

Another MAILED-FISH of the same *Species*.

The MAILED-FISH of *Brafle*. It hath a near resemblance to the former; from whence I have Nam'd it. I find it no where describ'd. 'Tis $\frac{1}{2}$ a foot long. His Head an inch and $\frac{1}{4}$ long, and near as broad. On the hinder part of his Head he hath three Angles, one on each side,
and

and a third in the middle. The Forehead almost flat. His upper Chap Elliptick. The *Orbits* of his Eyes round, $\frac{1}{4}$ of an inch over, an inch behind his Nose-end, $\frac{1}{4}$ distant. A little before the Eyes, two large holes like Nostrils. His Mouth a little prominent, near $\frac{1}{2}$ an inch over. His Lips in the place of Teeth, only rough. His lower Jaw and Belly flat. His Body before, an inch and $\frac{1}{2}$ broad, an inch and $\frac{1}{4}$ high, his Back round, the Sides ending in two Angles. His Tail taper'd, and with the Sides a little flat.

One half of the Gills opens on the sides, the other underneath in the Breast. The Fins are eight. The Gill-Fins of an unusual structure, having their utmost Spine or Bone very rough, thick and strong, above an inch and $\frac{1}{2}$ long, flat and crooked, almost like a *Reaping-Hook*, seven or eight times as big as any of the rest of the Fin-Bones. The Belly-Fins much less, and above an inch behind. Just over these the Back-Fin. On the Tail one above, underneath, and at the end: But the two first are here broken off.

His Head is cover'd with a brown and rough bony Helmet. His Back, Sides and Tail with Scales of the same colour, but a little lighter, rough, engraven with small parallel Lines, and of a Rhomboidal figure. His Breast and Belly only with a thin limber Skin.

The BRASILIAN NEEDLE-FISH; by the People of *Brasile* called TIMUCU. *Acus Brasiliensis*. *Marggravius* hath described and figur'd it well. 'Tis a long slender fish, from whence its Name. It hath also a pair of Chaps like a long Bill. He only omits the two scaly Lines which run along the Belly and Tail of the Fish, which every where else hath a naked Skin.

The CHAPS (perhaps) of the GREENLAND NEEDLE-FISH. The Teeth which stand in single Rows on the Edges of the Chaps are thick and strong, yet very sharp. In the lower Chap, near the two edges, are two furrows, into which the Teeth of the upper Chap strike. The two Bones which compose the Chap, are joyned together by an indented Suture, most curious to look upon. The fish seems next a kin to the common great *Needle-Fish*, or the *Girroch*, which is described by *Rondeletius*, *Aldrovandus*, and others, and pictur'd by *Johnston*, *Tab. 15*.

(a) Hist.
Anim. lib. 2.
c. 17.

It is an Observation of *Aristotles*, (a) That most fishes having

having no Gullet, but their Stomachs standing juſt behind their Mouths; it often comes to paſs, that while the greater purſue the leſſer, *περίπαι ἡ κοιλία εἰς τὸ στόμα*, their Stomachs come out into their very Mouths. Some reſemblance whereof, in a low degree, may be felt by thoſe that with an eager Appetite firſt begin to eat; the *Gula* riſing up a little as it were to meet the meat half way; which, upon its retreat, it ſucks in after it. Which hath happened in ſome with that violence, as to have endanger'd their being choaked.

[CHAP. IV.]

OF EXANGUIOUS FISHES.

THe Rough HORNED-LOBSTER. Given by Dr. *Thomas Allen*. I call it ſo, from the many pointed knobs which he hath all over his Back. *Squilla Crangone*. Deſcribed by *Rondeletius*. See alſo the figure hereof in *Gefner*, p. 1099.

This fiſh, inſtead of the Plates on the Tail of a common *Lobſter*, hath ſo many Fins, which for the far greater part of them are naked, or without a Cruſt upon them.

All *Lobſters* uſe their Tails, as Fins, wherewith they commonly ſwim backward by Jirks or Springs; reaching ſometimes ten yards at a Spring. For which purpoſe; whereas the Gill-Fins of other fiſhes, which are their Oars, are a little Concave backward; theſe have the Plates of their Tails when they bend them down, as they uſe to do, a little Concave forwards.

Another HORNED-LOBSTER with a ſmoother Back. Theſe fiſhes are the moſt pleaſant meat of all the Cruſtacious kind; except perhaps the *Punger*.

A CLAW of the GREAT LOBSTER. *Aſtacus Leo*. 'Tis above a foot long, and a foot and three inches round the middle. So that, ratably, the *Lobſter* it ſelf muſt have been about a yard in length.

TWO more of the ſame, a little leſſer.

The CLAW perhaps of a rare ſort of CAMARUS, with the inner Joynt forked. The

The MOLUCCA-CRAB. *Cancer Molucensis*. The best figure hereof is given by *Besler*, who alone shews the Eyes; yet not so clearly as could be wished. Not ill described by *Joh. de Laet*. That which *Clusius* makes to be the fore part, he makes the hinder: and *Wormius* doth the like; and saith, it is plain, from the position of the Legs; With both whom I agree. And to what *Wormius* saith, I also add, the position of the Eyes; for from *Clusius's* Description, it would follow, that they stood in the hinder part of the *Crab*. Here are eight or nine of them; the entirest and largest, given by *Henry Whistler Esq;*

The Eye of this *Crab*, hath a horny Cover. But stands almost flat, or in the same plain with the rest of the shell. 'Tis pleasant to look on, being latticed like the Eye of a *Butterfly*. The latticed-work is discernable to a naked Eye, but much better through a Glass.

(a) J. de
Laet. l. 2.

The People (a) that live near the River *Chovacoël* in *Nova Francia*, pile their Shafts with the Tails of this *Crab*, which breeds there abundantly.

The CLAW of the PUNGER, or the VELVET-CRAB, called *Pagurus*. It is one of the biggest sort; and the best meat of any. *Linschoten* reports, That some (but he saith not of what kind) in *India*, have been found so big, that whensoever they got any man with in their Claws, it cost him his life.

The PRICKLED-CRAB. *Hippocarcinus*, or *Cancer asper*, because of the Spikes that grow upon his Back. They breed near *Normay*.

Another with a great number of Center-shells growing upon its Back.

(b) De Part.
Anim. lib. 4.
c. 8.

(c) Ibid.

It is noted by *Aristotle*, (b) That all *Lobsters* and *Crabs* have their Right Claw, the greater and stronger. *Crabs* have no Tail, nor need it, saith the same Author, (c) as *Lobsters* do to swim with; because they live much upon the Land.

(d) Mus.
Calceol.
Sect. 1.

CRABS-EYES. *Oculi Cancrorum*. A *Crustaceous-stone* so called, growing as is commonly (but I doubt falsely) said, in River *Crabs*. Especially, saith *Cérutus*, (d) in the Female, at that time, when the new shell begins to grow.

Both the Powder and the Magistery of *Crabs-Eyes*; and the Claws, and Distilled-Water of *Crabs*, are all used in Medicine.

The

The NAKED-SHRIMP, commonly called *The Souldier-Crab*. *Cancellus*. Here are two of them housed; one in a *Sea-Snail-shell*; the other in that of a common *Wilk*. It is accurately described by *Aristotle*. (a) His fore part is armed with crustaceous Plates, as the *Lobster*, but rather resembles the *Shrimp*. His hinder part is naked, or without a Crust: from whence I take leave for the Name: Neither the usual *English* Name, nor the *Greek*, *καρπελίον* (according to which the *Latin*) being futable to the shape of this Animal, a quite different kind from a *Crab*.

(a) Hist. An.
lib. 4. c. 4.

Two NAKED-SHRIMPS unhoused, or without a shell.

This Animal, because his hinder part is naked, always houses himself in some empty shell, or other capable Body. When he hath filled one shell with Excrements, saith *Bellonius*, or grows too big for it, saith *Aristotle*, he transplants himself to another. Those that house themselves in the shell of the little long *Wilk*, or the *Purple-Wilk*, are called *Little Souldier-Crabs*, those in the great *Wilk-shell*, the *Great Souldier-Crab*: and so, if in other shells of like bigness.

The INMATE-CRAB. *Pinnophylax*. Because it is said to watch for the Prey, and to give notice to the *Pinna* when to apprehend it. 'Tis shaped like a *Crab*; but seldom grows bigger than a *Chesnut*. They are of a lovely white, and some with rays of a light Red or Pinck-colour. One difference betwixt the *Cancellus* and this, is, That *that* always chooses an empty shell, *this* hospitates with the living Animal in the same shell. He cohabits not only with the *Pinna*, but also the *Muscle*, *Oyster*, and *Scallop*.

The PREKE or POULPS. *Polypus*. See the Description in *Rondeletius* and others. 'Tis a *Naked-Fish*, having eight Fingers or Arms spread out almost like the Rays of a *Star-Fish*, and the Mouth in a manner in the middle of them. Their Arms serve them both to swim with, and to Attaque the Prey. When they are pursu'd by a fish, they presently cast forth a black Liquor, which they have always ready in a Bag, and wherewith they darken the water, and so make their escape. Being boiled with Wine and Spices, they are, saith *Moufet*, (b) a very excellent meat.

(b) Lib. de
Re Cibariâ.

The SMOOTH STAR-FISH or SEA-PAD. *Stella*
R *marina*

marina lævior. It was sent from the *East-Indies*. I find it not described. When alive, it is of a flesh-colour. It hath five Arms or Rays, each an inch broad, and proportionably very long, *sc.* above five inches; the Trunk being not above an inch and $\frac{1}{2}$ Diameter. The upper or convex side is wrought all over with very little lenticular knobs, almost like a *Chamæleon's* Skin; with small Concavities interjected, like those in *Poppy-seed*. Underneath, each Arm is furrow'd, the Margins of the Furrows being set with a kind of curious Fring. The Margins of the Arms wrought with Lenticular eminencies set in a straight Row, and besprinkled as it were with little *Century-seed*.

All *Stars* have their Mouths in the middle underneath, as the *Sea-Urchin*. They feed upon Shell-fish. And seem, saith *Rondeletius*, to have no other passage for their Excrements, but their Mouths. Whereof I much doubt. They take the Prey, as the *Polypus*, and swim very swiftly, by stretching out or contracting their Arms at their pleasure.

The BRANCHED STAR-FISH. *Stella marina arborescens*. A rare kind. It was taken in the Bay of *Massachusetts* in *New-England*. See the Description hereof in *Rondeletius*, and out of him in *Wormius*. As also in the Philosophical (a) Num. 57. *Transf.* (a) under the Title of *Piscis Echinostellæ Visciformis*. Before I had perused these, I had drawn up a Description of my own, which I will take leave to subjoin. It is above a foot Diametre. The Mouth, in the middle, is divided into five Lips. The figure both of this and of the Trunk or Body is pentangular. The Diametre of the Trunk almost three inches. The sides grow thin from the Mouth to their Edges, which are so many exact *Hyperbola's*.

From the five Corners of the Trunk, as many Branches being produced, are presently each divided into two others, about an inch in compass; round, but by a double Row of little knobs, seeming to be square. Each of these, are again subdivided into lesser and lesser Branches. The last whereof, are scarce thicker than a Horse-Hair. In number, by a moderate estimate, above a Thousand.

As he swims, he spreads and stretches out all his Branches to their full length; but so soon as he perceives the Prey within

within his reach, he hooks them all in, and so takes it as it were in a Net.

The PRICKLED STAR-FISH. *Stella marina hirsuta*: Perhaps *Rondeletius's Pectinata prima*. It hath five Arms, each Arm pointed, and also slender or narrowed next the Trunk, but spread in the middle. Two inches and $\frac{3}{4}$ long; the Trunk it self not above $\frac{1}{2}$ an inch Diametre. The upper part hath a rough shag of short Prickles; the other, of longer: where also the Arms are furrow'd. These innumerable Prickles upon their Arms, are all movable, as in the *Sea-Hedg-Hog*.

Three more PRICKLED STAR-FISHES; which indifferently answer the second, third, and fourth of *Rondeletius*.

The CROWN'D-STAR-FISH. *Stella marina Coronalis*. It was taken in the *Danish-Sea*. I meet not with the Description any where. 'Tis a little One. It hath five short Arms, bluntly pointed, about two inches long. The Trunk two inches and $\frac{1}{2}$ over, the five Sides whereof are Hyperbolick. The upper part rises up like a Crown, adorned with round Knobs of the bigness of a green Peas, with other little ones, on both sides like Pins heads, ranged into five even Rows from the ends of the Arms to the top of the *Star*; in some sort, as precious Stones are set upon a Royal Crown: from whence I have named it. The spaces also between them are beset with little knobs. The edges of the Arms and Sides are in like manner set round about with lesser upon greater. Underneath, the furrows of the five Arms meet in the middle, paved with little Stones almost like Teeth; the broad Margins, with other round knobs or stones.

These *Stones*, are in colour, substance, and nature congenerous, with those which are commonly called *Crabs-Eyes*.

The HIGH-CROWN'D STAR-FISH. It differs from the former, in being much taller, and in having no Knobs, but only Spikes, the one half whereof are ranged into certain correspondent Orders.

A FLAT SPIKED STAR-FISH, taken in the *German Ocean*.

Little STAR-FISHES with five Arms, taken in the *British Seas*.

A STAR-FISH with fix Rays or Arms. They are almost like those of the smooth *Star-Fish*; excepting, that two of them are as short again as the rest. Whether a monstrous Production, or a distinct *Species*, I cannot say.

A STAR-FISH with TWELVE RAYS; by some called *Sun-Fish*. 'Twas taken in the *British-Sea*. The *Basis* of each Ray is much slenderer than by the figure in *Johnston* is represented. Neither is it shag'd only on the edges, as in the same figure, but all over.

SECT. VI.

OF SHELLS.

CHAP. I.

Of whirled and single SHELLS.

THere is a large Treasure of Shells in this *Musæum*: in all, great and small, about six hundred. The Reduction of all which to the Order of Nature, whoever shall go about, will find to be no little Task. Nor can it be perfectly done here, because as yet the Collection it self is not perfect. According to the best Method I can at present think of, I shall here place them. And that it may be the better judged, how far it is natural, or not, I shall afterwards digest them into Schemes. Most of them are Strangers in *England* and the *British-Seas*, and therefore I must be allowed a little more than ordinary liberty for the *English* Names.

Note, That when I speak of the Right or Left Lip of a Shell, I mean, as it is held with the Mouth downwards.

The FROG-WILK. *Murex Coracoides*. Described and pictur'd by *Johnston* out of others. As are also most of those that follow, which are only named. It hath three Appendices on each side, like fingers or feet, and one at the end. The

The BROAD-LIPP'D WILK. *Aporrhais*. The Lips of this are pale and even. Of this kind, three great Ones are here preserved, one of them above a foot in length.

The BROAD-LIP'D WILK., with wrinkled Lips, and dyed with a deep purple. See a curious figure of this in *Calceolarius's Musæum*, (a) under the Title of *Conchilium* (a) Sect. i. *Muricatum*. This Shell, saith *Cerutus*, (b) the *Indians* use (b) *Ibid.* as a Trumpet, both in their Wars, and in Hunting.

The MARBLE WILK. *Murex marmoreus*, from its mixed colours, which make it look like spotted Marble. Of these, here are five.

The ORIENTAL WILK. *Murex Orientalis*. The right Lip of this is even. Here are four great Shells of this sort, near a foot in length.

Another ORIENTAL WILK, with the right Lip undulated.

Betwixt the three sorts of Shells above mentioned, there is this difference, That the right Lip of that commonly call'd *The Oriental*, is only expanded; that of the marbled, expanded or spread, and turned outward; of the *Broad-Lip'd*, spread outward, and as it were Finger'd.

A SHELL like the ORIENTAL, with a KNOBED Turban or Whirle.

Another of the same sort with an EVEN Whirle. It is a small shell, not above an inch and $\frac{3}{4}$ long. Forward, somewhat flat, and white as Milk. Hinderly, stained with tawny spots. The left Lip is turned or spread out. The right, at the bottom wrinkled, and stained with a light purple. Towards the Cone or fore Corner, is gather'd into an open Angle. The *Whirle* is smooth, not very high, maketh six Rounds.

The LONG-MOUTH'D WILK. *Murex Labris parallelis*. Both the Lips of this are plain or even on the Surface. I call it *Long-Mouth'd*, because the Mouths of all that have been nam'd before, are very wide.

The LONG-MOUTH'D WILK, with oblique furrows on the left Lip. Here are four of this sort: whereof one is near $\frac{1}{2}$ a foot long. Each of the inner Rounds of the *Whirle* or *Turban*, is one third part lesser than that next without it.

The SPIKED-WILK. *Murex Aculeatus*. This, of all the

(a) Tab. 32. f. 5. the rest, hath the Name, *Murex*, most properly given it; from the spiked Instrument used in War, so called. The Spikes of this are round. Here are three of these Shells, one of which is $\frac{3}{4}$ of a foot long. Well figur'd by *Olearius*. (a) And better by *Besler*.

The SPIKED-WILK, with doubled or PLAITED Spikes. Here are two of this sort, one of them near $\frac{1}{2}$ a foot long. Both the Lips are a little drawn outward, and so the Mouth almost Oval, both the corners thereof pretty long, the left Lip spread outward, the right wrinkled; the main Body somewhat Conical, the *Whirle* low, consisting of six Rounds; both striated, and armed with plated Spikes standing in a spiral Order.

The BOSSED or KNOBED-WILK. In the place of spikes it hath round knobs. Here are five or six, all lesser ones, about the length of a *Katharine-Pear*; so that 'tis probable they grow not much bigger.

The CONICK SNAIL. *Cochlea Cyndrica*; so it is commonly called by *Zoographers*, but very improperly, the figure hereof being Conical. Here are about fourteen of this sort. Whereof some have a plain, others a knobbed *Turban*. Some are all over white, or yellowish, others are stained white and black, or blackish-bay, white and brown, or white and yellowish. In some the colours are laid in spots, in others undulated, and in some others Lattice-wise. *Rondeletius* saies, That this Shell seldom exceeds the thickness of the *Thumb*. Yet one of these is above $\frac{1}{2}$ a foot long, and the Base above three inches over. The rest are small, all of them plain *Cylinders*. Not unelegantly express'd in some variety of figures by *Olearius*, *Tab. 31. and Fig. 3. of Tab. 32.*

The *Whirle* maketh nine or ten Rounds: which hold the same proportion one to another, as in the *Long-Mouth'd Wilk*. In the Kingdom of *Congi*, and some other places in the *East-Indies*, these Shells go for Money.

The CONICK SNAIL a little convex, and with the Rounds of the *Turban* also convex.

Another Convex Conick Snail, with the Rounds of the *Turban* Concave.

The GREAT PERSIAN WILK. *Concha Persica major*. Of this sort there are four here preserved, of which, two are above $\frac{1}{2}$ a foot long. This

This *Wilk* yields a purple juyce, anciently used for deying. The Cover of this Shell is called *Onyx* or *Unguis*, because in shape like the Claw of a Carniverous Bird. The best of these *Opercula* or Covers are found in and brought from the *Red-Sea*.

The lesser PERSIAN WILK, with furrow'd Lips. Of this sort there are five here preserved of a middle size. The *Great Persian Wilk* is knobbed, and hath only one Series of wrinckles. This even, and with a double Series of wrinckles a cross one to the other. Each of the outer Rounds of the *Whirle* is double the thickness of the next within it.

The lesser PERSIAN WILK with even Lips. 'Tis a small shell, scarce bigger than the Kernel of a *Filbert*. The Mouth is almost Oval, each Corner ending in a small Channel. Both the Lips are turned outwards sideways, and as far as the end of the *Turban*. The Back is speckled with white, red, and blew. The *Turban* not high, nor hath more than three Rounds.

The PERSIAN WILK, with the Rounds of the *Whirle* plated and interrupted; so as the Plates of the several rounds do anticipate one another. Of these here are three.

The FLAT-LIP'D SNAIL. *Cochlea sinistri Labri angulo duplici*. Not described. In a manner half a long Oval. The left Lip is flat, whereby it hath a double edge. Deep within, 'tis stained with a shining Bay. The left Lip near the *Turban* almost an inch broad; before, it ends sharp. The *Turban* maketh but about two Rounds. Both this and the Body are beset with knobs in a spiral order, and are cover'd over with a pale purple Crust.

The short FLAT-LIP'D SNAIL. 'Tis white within; yet the left Lip is stained with two Bay spots. The Back of a light ash-colour. The Knobs of this have no Incrustation. The Rounds of the *Turban* are three.

The WRINKLED-SNAIL. *Cochlea rugosa*. Here are two of these, whereof one is near $\frac{1}{2}$ a foot long. Each of the outer Rounds of the *Turban* is twice as big as the next within it. One of these is curiously figur'd by *Besler*.

The HOOK-NOS'D SNAIL. *Cochlea Rostrum recurvo*. So
I call

I call it, though it is not properly the Nose or Beak of the *Snail*, but of its shell. The *Turban* is pretty high. Both this and the Body are wrought with knobs and lines in an oblique and spiral Order.

(a) In his
Purpura. But
better in his
Book de A-
quat. &
Terrestr.

The SNAIL with the SPIKED TURBAN. *Cochlea Turbine aculeato*. This shell is described and figur'd by *Fabius Columna*. (a) Yet in some things he hardly reaches it. The Mouth is a kind of long Oval. The right Lip is spread, and as it were doubled outward. The Back faced with smooth Plates like so many more lips, carry'd obliquely from the left Lip to the *Turban*, and there set with short but very sharp Spikes. The spaces betwixt these are $\frac{1}{2}$ an inch broad, wrinkled with very small furrows, and curiously stained with pillars of white and brown lines meeting together in several Arches, as if it had been done by a *Painter*.

The SHORT-NOS'D SNAIL, with a low and plain or even *Turban*.

The DIPING-SNAIL. *Cochlea Immerso Turbine*. Not described. In other *Snails* the Rounds of the *Whirle* stand either in or else above a plain; here, they dip or run down within the shell. Here are divers of them; all very smooth, and of an Oval figure. One of a white colour, besprinkled with an innumerable company of small brown specks; about the bigness of a little *Horse-Plum*. The rest are smaller.

The LONG-MOUTH'D SNAIL. *Cochlea Labris parallelis, s. Cyliandrovalis*. The figure hereof is betwixt Cylindrical and Oval. One half only of the left Lip is turned outward, and uneven with oblique furrows. The right Lip plain. The fore-angle of the Mouth crooked. The Rounds of the *Turban* furrow'd, not high, four or five in number. The Back is painted with a mixture of yellow, bay, blew and black specks. It is about two inches long. There are some more of the same *Species* that are less.

The NAVLE-SNAIL. *Cochlea Umbilicalis*. The *Turban* of this is smooth. The end of the inmost Round is produced like a *Navle*, whence its Name.

Another sort of NAVLE-SNAIL. The *Turban* of this is set with short doubled or plated Spikes. It is almost a foot in length. The

The OVAL LONG-MOUTH'D SNAIL. Scarce bigger than a *Filbert Kernel*. The Lips are parallel. The right turned or doubled outward. The left uneven with three oblique furrows. The Back speckled with white and red. The *Whirle* hath four Rounds pretty high.

The PURPLE-WILK with solid Spikes. *Purpura aculeis solidis*. This and the other kinds commonly found in the *Dead-Sea*.

The PURPLE-WILK with long plated Spikes. *Purpura Aculeis plicatis longissimis*. By *Ferranto Imperato*, called *Echinata*. *Olearius* gives a good Figure, (a) *Fab. Columna* (a) Tab. 29. fig. 1. the Description, with the Title of *Purpura muricata sive Murex Rostratus parvus*. I will add my own a little fuller. The main Body is not much bigger than a good big *Nutmeg*. But hath a Horn no less than two inches and $\frac{1}{2}$ long, near the Mouth $\frac{1}{4}$ of an inch over, and sharp-pointed. Almost a Pipe, but a little open underneath by the length. Along the right Lip and the *Turban* it self, in three Rows, stand several long sharp plated or gutter'd Spikes triangularly. But on the *Turban* they a little anticipate each other. As also do the Plates of the several Rounds. The right Lip is in some sort toothed, the left turned outward.

The PURPLE with REDOUBLED SPIKES, *i. e.* with the greater doubled Spikes collaterally subdivided into lesser. Of these there are four. Two of them white, described by *Columna* with the Name of *Purpura sive Murex Pelagius marmoreus*. Another, ash-colour'd; and a fourth, brown.

All *Purples* have a Canale or Gutter'd Horn long or short, in which is lodged that part which is called the *Tongue*; but performs the same Office as the Gills in other Fishes. (b) The Animal creeps and directs its own way with its Horns, like a *Snail*: yet hath it not four, but two only. (c)

The *Purple Tincture* it yields, is contained betwixt that part which is called the *Papaver* and the Neck. (d) It is of a different degree; in some, more upon the Red, like that of *Cochinele*; in others, more upon the Blew, like that of *Violets*. It was anciently (pressed out of the living Animal, and) used especially for the deying of *Silks*. But is now grown out of use, as is likely, from the great abundance

(b) *Fab. Columna. Purpura.*

(c) *Mart. Lyster de Cochl.*

(d) *Aristot. Hist. Anim. lib. 5. c. 15.*

(e) *Musæum Worm.*

abundance of a sort of *Fucus*, which the *Italians* call *Roccella*, wherewith *Silk-Dyers* do now make very rich *Purples* of all varieties, with less labour and charge. (a)

(a) Fab. Colum. Purpura.

That little Shell called *Blatta Byzantia*, is the *Operculum* or Lid of the *Purple*.

The SQUARE-WILK. *Buccina Rhomboidea*, i. e. It hath in a sort four equal sides, with unequal Angles. I find it not describ'd. The Mouth almost Oval, both the Corners a little gutter'd. The right Lip is first turned outward, and then doubled or returned back again inward; and the edge a little toothed. Just opposite to this Lip, is laid upon the shell a kind of *list*, and doubled down in the same manner. Upon every Round of the *Turban* also are certain edged pieces in two opposite Rows. By these and the *list* above said the shell is made square. Both the main Body and the *Turban* are wrought over with knobs great and small standing in oblique and spiral Orders.

All WILKS that have the Rounds of the *Turban* thus edged, are betwixt a *Purple* and a common *Wilk*.

The LONG SQUARE WILK. Neither do I find this described or figur'd. Both the doubling of the right Lip, and the opposite *List*, are less close, than in the former. Neither hath it any of the larger knobs.

The LONG THICK-LIP'D WILK. The right Lip of this is swoln or stands thick outwardly; and on the Rounds of the *Turban* are many edged pieces.

The same sort of WILK, with few edged pieces on the *Turban*.

The THIN-LIP'D WILK. The fore Corner of this ends in a gutter'd-Horn. *Columna* describes and pictures it with the Name of *Buccinum Rostratum*. (b)

(b) Lib. de Aquatil. & Terrest.

The GREAT THIN-LIP'D WILK. *Strombus magnus*. This sort hath edged pieces on the Rounds of the *Turban*. The biggest of turbinated-shells: this here is almost $\frac{1}{2}$ a yard long, and above $\frac{1}{2}$ a yard round about.

The TRIANGULAR WILK. No where describ'd that I find. The Mouth almost Oval. The fore Corner hereof ends in a gutter'd-Horn bended a little upward. The left Lip only turned outward. The right is first bended outward, and then doubled or returned inward. From thence

at

at the distance of $\frac{1}{3}$ ^d of the circuit of the shell, is laid a Lift, in shape imitating the said right Lip. At the same distance, a pretty broad-pointed knob. By both these and the right Lip the shell is made Triangular. The knobs on the right Lip and Lift, are white, the other parts tawny, and as it were wrinkled. The *Turban*, which hath six rounds, is also a little angular.

The COMMON WILK. This sort is short-snouted, or hath no horn. Of this sort are several here preserv'd.

It is affirm'd by *Aristotle*, (a) That you may know how many years a *Wilk* is of, by the number of Rounds in the *Turban*. Of the manner of laying their Eggs, see *Bellonius*. They are desired by some, as a rare sort of Meat. The best are in clean Creeks. That which Mr. *Lyster* describes, (b) by the Name of *Buccinum maximum*, is fished out of the Sea at *Scarborough*.

(a) Hist. An.
lib. 5. c. 15.

(b) De
Cochl. Mar.
Tit. 1.

A *Wilk*, saith *Nicolaus Myrepsius*, being burnt, powdered, and mixed with old Oil to the consistence of Glew, and so the Head, first shaved and rub'd, anointed therewith, is an admirable Remedy against Baldness and Morph of long standing. 'Tis usual to give Drink to Children that have the *Chin-Cough*, out of a *Wilk-shell*; and it is observed, saith *Wormius*, (c) to do them good.

(c) Musæum.

The WILK-SNAIL. *Buccinocochlea*. So I call it; because, in Figure, it approaches to the *Wilk*; to the *Common Snail*, in the thinness of its shell. *Columna* (d) describes and figures this with the Title of *Buccinum exoticum variegatum*.

(d) Lib. de
Aquat. &
Terrest.

The WILK-SNAIL winding, from the Mouth, towards the right Hand; whereas almost all other shells wind the contrary way. The Mouth is white as *Milk*, and almost Oval. The left Lip spread and turned outward. The Rounds are Convex, as in the *Wilk*. In number six, speckled with yellow Bay and blew spots. The shell is as thin as that of common *Land-Snails*. Of kin to that shell described by Mr. *Lyster* under *Tit. 1. lib. de Cochl. Mar.*

The BELLY'D-LONG WHIRLE. *Turbo Ventricosus*. This shell runs all into a *Whirle* or *Turban*. It is also belly'd, i.e. swells out a little betwixt the Mouth and the Cone. And the left Lip is uneven with oblique Furrows.

(a) Lib. de
Aquat. &
Terrest.

The WHIRLE-SNAIL. *Turbocochlea*. The rounds of this sort wind from the Mouth to the right Hand, and that very obliquely, in number six, speckled with *Chestnut* spots in Rows: The Mouth very long, and one Lip ridged. 'Tis thin like a common *Snail-shell*. *Columna* (a) describes and figures one pretty like this by the Name of *Turbo alter minor*.

(b) Lib. de
Cochl.

The SMALL WHIRL-SNAIL, with numerous rounds, and also winding from the Mouth toward the right Hand. There are about fifty of them in a Bottle. They are of a brown colour; and thin as the shell of the common *Snail*. Their Mouth almost round. The right Lip hath a little Angle. It hath nine rounds with very small *transvers Striæ*. *Columna* describes and figures one like this with the Title of *Turbo Terrestris non descriptus*. Mr. *Lyster* (b) calls it *Buccinum pullum*; and very aptly compares it, both as to shape and bigness, to an *Oat*. He saith it is found in *England* in the Cracks of *old Trees*, and in *Garden-walls*.

The BELLY'D-LONG WHIRLE, with small spiral Furrows.

Another BELLY'D-LONG WHIRLE, with little knobs in spiral Orders.

The LEVEL-WHIRLE, or the SPIRE. *Turbo planus sive verè Conicus*. The rounds are all knobbed, and the right Lip gather'd into small wrinkles.

Another KNOBED SPIRE, with the right Lip plain or even. Here are several little Ones of this sort.

(c) Lib. de
Cochl. Mar.

The SMOOTH SPIRE, with high or swelling rounds. Here are two sorts of these; one with oblique, the other with spiral small Furrows. This shell is described by Mr. *Lyster*. (c)

The SMOOTH SPIRE, with flat rounds. Here are also two sorts of these; the one furrow'd, the other not, described and figur'd by *Columna* under the title of *Buccinum Persicum eburneum nitidum maculosum*. Of all these here are several small Ones.

(d) Joh. de
Laet.

The Natives of *Brasile* make a sort of Musical Instruments with these kind of shells. (d)

The LOOSE WHIRLE. *Penicillus*. The one half of it windeth loofely like a *Worme*; the other is a small long *Turban*.

The

The SHORT WHIRLE. *Trochus*. This is somewhat more prolonged than some others of this kind, the *Base* broader, and the *Rounds* in a level. Of this sort here are two great Ones; curiously stained with Crimson waves from the *Base* (which is about four inches over) to the *Cone*. It is of kin to that which by *Columna* is called *Turbo Persicus maximus*.

Another level SHORT WHIRLE, also somewhat longer than the rest, and with the *Rounds* in a level, but the *Base* narrow.

A thin level SHORT WHIRLE, shorter than the former, and with flat rounds. Here are two sorts of this; the one with smooth, the other with rugged or knobbed rounds.

A fourth WHIRLE of the same kind, with high rounds. Here are also two sorts of this; the one smooth, the other rugged.

The BELLY'D SHORT WHIRLE with spiked rounds. 'Tis no where described that I find. The *Base* two inches broad, the *Cone* as high. The Mouth almost round, and within of a *Pearl* colour. The whole shell without whitish. The *Base* all over wrought with round, and obliquely radiated wrinkles. The rounds are knobbed, and the under edges of every round with flat doubled Spikes. Here are two more of the same sort, with the Spikes ground off.

Another BELLY'D SHORT WHIRLE, almost smooth, having only very small wrinkles, without any Spikes.

The CONCAVE SHORT WHIRLE. *Trochus centro latè concavo*. Hitherto undescrib'd. 'Tis two inches broad, an inch an $\frac{1}{4}$ high, being Belly'd, and having the *Cone* much depressed. As also the Mouth, which is therefore a flattish square. Both the *Base* and the *Rounds* are wrought with small spiral and radiated wrinkles running across. It hath five or six rounds, somewhat swelling. Not, as in most other shells, contiguous in the centre, but thence receding, leave a wide space in the middle of the shell, representing in some sort a pair of Winding-Stairs. The ridges also of the rounds are wrought with *Tooth-Work*, answering to the Sculpture on the edges of a Stair-Case.

There are several sorts of short Whirles or *Trochi*, saies Mr. Lyster, (a) found in *England*, as at the Mouth of *Umber*, and in *Lincoln-shire* by the Sea-side. The

(a) Lib. de
Cochl. Mar.

The LITTLE ROUGH WILK. *Nerites Turbine rugoso.*

The LITTLE KNOBED WILK. *Nerites Turbine tub-rato.*

The GREAT ROUND-MOUTH'D SNAIL, with a Pearl colour. *Cochlea cœlata.* Here are three of these; of which two, are each above $\frac{1}{2}$ a foot wide. Their pearly gloss, on the outside is artificial; within, natural. The natural colour without is sometimes green, with white and bay spots.

One way whereby it receives a bright pearl colour, is by being steeped in *Vinegar*; which eats away the rough and duller surface.

The GREAT NAVLE-SHELL. *Umbilicus marinus Indicus major.* It is the lid of the *Cochlea Cœlata*; and hath its Name from its shape. Very well described by *Wormius*.

The LITTLE NAVLE-SHELL, with wrinkled edges.

A SECOND, with the Convex side more plainly winding like a *Navle*.

A THIRD, with the same side besprinkled with a great company of small round knobs.

The little *Navle-Shell* is well express'd by *Olearius, Tab. 33. Fig. 7.* Here are several of them kept in a Glass.

Not only this, but other turbinated shells have their lid. Which, as *Mr. Lyster* well observes, is as it were another *Valve*.

Spirit of *Nitre* droped upon this Shell, riseth up with a strong *effervescence*. The admirable *Virtue* of this Shell is experienced, saith *Wormius*, (a) by men of very good note, in stanching of *Blood*; the flat side hereof being only applied, with *Spittle*, to the *Forehead*. 'Tis usual to lay a cold *Key* or *Stone* in the *Neck*. But if the same, especially a good big *Pebble* with one side flat, like a *Painters Mullet*, were apply'd to the *Forehead*, I should expect as good advantage from that, as from the application of this shell.

(b) Lib. de
Gem. &
Lapid.

The Women in *France*, saith *Boetius*, (b) *nimio Mensium fluore laborantes*, commonly take this shell reduced to a fine powder, which they find to be a very good remedy, and keep it as a *Secret*.

The LESSER ROUND-MOUTH'D SNAIL, with a shorter knobbed *Turban*.

The

The SPIKED or TOOTHED SNAIL. *Cochlea Echinophora sive Echinis plicatis*. Of an ash-colour. The Mouth round. The *Turban* short, having only three rounds almost flat. The *Base* wrought with circular wrinkles. The utmost round, as it were toothed with short flat-doubled Spikes.

The FINGER'D SNAIL. *Cochlea Dactylata*. Not yet described. The Spikes of this are doubled and redoubled; yet not flat, but thick and round, so as to resemble so many little Fingers. Without, it is of a sad brown. Within, of a Pearl colour. The Mouth round. The *Turban* low; making only three rounds, which so recede from the centre, as to leave an empty space in the middle of the shell. 'Tis all over rough with small plated Spikes, and pointed wrinkles in a spiral Order.

The HIGH-CROWN'D SNAIL, with a semicircular Mouth.

The LOW-CROWN'D SNAIL, with a semicircular Mouth.

The HALF-LIP'D SNAIL. So I call it, because one half of the inner Lip being spread outward, the other half seems as if it were clip'd off. Of this here are two sorts; one with the upper, the other with the nether half deficient.

Another SNAIL like the former, saving that the inner Lip is whole, and the *Turban* somewhat higher.

Another SNAIL with the *Turban* somewhat lower. Of this here are two sorts; one with the rounds of the *Turban* even or smooth; the other, wrinkled.

The SEMICIRCULAR MOUTH, TOOTHED on both sides. The Teeth of the outer Lip are the lesser; they stand not on the edge of the Lip, but deep in the Mouth, just over against the inner Lip: where the white parts of the shell on both sides are defined or circumscribed by a Circle, whose centre is at the edge of the inner Lip. Outwardly, the shell is speckled with white, red, and black Spots, and rugged with spiral wrinkles. One like to this is described by *Columna* with the Name of *Cochlea marina marmorea*.

The BLOBBER-LIP'D SNAIL. *Cochlea Labrosa*. The Mouth of this is also Semicircular, the outer Lip being round

round and spread out a little; the inner strait, like white *Marble*, its inner edge toothed, and spread outward almost as far as the *Navle* of the shell; from whence I have nam'd it. The *Turban* is low and almost flat. It maketh scarce more than two rounds, which therefore immediately run from great to small. On the outside 'tis ruged with transverse wrinkles, and speckled with red and black spots upon white.

The toothed Lips of both these last Shells, most probably, serve as Joynts to hold their lids, so much the more close and steady.

The FORE-WHIRED SNAIL. *Cochlea Turbine antico*. This is no where described. 'Tis smooth, of an ash-colour. The outer Lip is spread a little backward; and toothed within: as is also the edge of the inner Lip. Both the corners of the Mouth are placed on the circumference of the utmost round. Whereby, contrary to all other shells I ever yet saw, it hath the *Turban* or *Whirle* made before. 'Tis much depressed, consisting of five flat rounds. The assertion of *Aristotle*, (a) That the *Turban* always stands behind, is here proved false.

(a) Hist.
Anim. lib. 4.
c. 4.

The FLAT-WHIRLE. This *Snail* is a perfect *Helix*, all the shell lying as it were between two levels. Of this kind Mr. *Lyster* (b) describeth three sorts. Of which he observes, That upon the sprinkling a little Salt or Pepper, or the like, into their Mouths, they yield a Crimson liquor.

(b) Lib. de
Cochleis.
Tit. 26.

(c) Ibid. p. 1. The same Author (c) hath observed some particulars of the parts of *Snails*; as their Horns, Eyes, (as he supposeth them) Teeth, *Anus*, Lungs, milkly Veins (which are all they have) parts of Generation, &c. Which last, saith he, are so like, as to make it seem very probable, That they are *Hermaphrodites*. In the time of Coition, they strike a sort of small testaceous Needles (*Spicula testacea*) into one another's Necks. For what cause, or in what manner, he could not so well observe.

No Shell with a *Turban*, hath less than two rounds, nor hath any, saith the same Author, (d) of *English* Shells, above ten.

(d) Ibid.

The flick SAILER. *Nautilus lævis*. This sort is brown on the Back, and black on the Belly. Curiously figur'd both in

in *Calceolarius's Musæum*, and by *Besler*. Here are two of them, whereof one is near $\frac{1}{4}$ of a yard long.

One half of the same sort of shell cut down the middle. By which it appears to be divided by about 40 oblique transverse Partitions.

The Animal is of kin to the *Polypus*. Famous for the Art of Navigation. He rises to the top of the Water with his Shell inverted; and being there, returns it. Then having a thin Membrane spread against the Wind for a Sail, two Feet for the Rudder, and two for the Helm, he sails along. If any fear arises, he pulls all in, and filling his shell with Water; immediately sinks himself to the bottom of the Sea. (a)

The PEARLY SAILER, 'Tis both within and without of the colour of the best Oriental Pearl. This sort is brought from *India* and the *Persian-Gulf*. Hereof *Necklaces* are sometimes made. As also Images and Beads used at Devotions.

The SPIKED SAILER. The Back and Belly of this are flat with two ridges, and on each ridge grows a row of short Spikes.

The MAILED SAILER. *Nauticlus Laminatus*. I meet with it no where. Both within, and especially without, of the colour of the richest Pearl. It is composed of a considerable number of Plates, as if in Armor. Yet the Plates continuous; furrow'd along the middle, and produced with a blunt Angle, almost like a Widows-Peak. From under each of which, emergeth a kind of little Tongue, like that of a *Shoo-Buckle*.

VENUS-SHELL. *Concha Veneris*. Because beautiful. Or else, saith *Terzagi*, *quod partem Veneris Imperio subditam referat*. The first I shall name is that with Blobbed-lips, or having as it were a white thick Facing. They are also furrow'd, and stained with *Chestnut* Spots. But the Back with a *Purple*.

VENUS SHELL, with the right Lip furrow'd, but neither of them faced or turned out.

A SECOND of this kind with the left Lip furrow'd.

A THIRD, with both Lips furrow'd.

The HIGH-BACK'D VENUS-SHELL. Of this kind, here are three of a *Chestnut* or *Bay-colour*; one stained

T

with

(a) Arist.
Hist. Anim.
l. 9. c. 37.
Scal. exercit.
Rondeletius
out of Oppia-
nus. Bello-
nius. And
out of him
Septalius's
Musæum.

with *Green*, another with *Brown*, a third with *white* spots. And a fourth, *white*, speckled with *yellow*, *red*, and *purple*.

The NAVLED VENUS-SHELL. 'Tis also somewhat high-back'd, and with each Lip furrow'd. On the thicker end, it hath some resemblance of a little *Turban* or *Navle*.

The LONG-VENUS-SHELL. Of this sort here is one stained with white spots upon a Bay ground. The rest of the same Figure, are somewhat rough, having, as 'tis likely, been steeped in *Vinegar*, or some other ways corroded.

The BUNCH-BACK'D VENUS-SHELL. Described and figur'd by *Columna* under the Name of *Concha utroq; latere se colligens*. It hath a transvers Angle or Ridge in the middle. Where also, there is a distinct piece, most closely inlaid into the Back of the Shell. The Lips also are both even.

The VENUS-SHELL with smooth or even Lips, and without any ridge on the Back. The little white Ones of this kind, are those which are particularly called *ENTALIA*. With these, saith *Rondeletius*, the *French* adorn their *Horses* Bridles, and other parts of Equipage. Of these and Jet mixed together, they also make *Bracelets*, and other Ornaments, for Widows in *Half-Mourning*. Many of this sort, striated, are found, saith Mr. *Lyster*, near *Hartle-pool* in the County of *Durham*, where the People call them *Nuns*.

Divers other lesser VENUS-SHELLS of several kinds, and stained with several colours, are here collected.

The *Italians* use this Shell for the polishing of Paper, and other things. (a) The people living near the *Red-Sea* gather them in abundance, and sell them to those that trade to *Memphis*; for with these the *Egyptians* smooth their Linnen Cloth. (b) *Goldsmiths* cut them in two, and make *Spoons* of them. They are commended against those *Ulcers* in the great Corner of the Eye, which usually turn to *Fistula's*, because of their admirable drying quality without heat. (c) Yet we have no reason but to believe, that most other shells may be of equal Virtue. But if we observe, it is usual for people to have a high esteem of those things, even as to their Medicinal Virtue, that look prettily, or that are rarely to be had. Whereas, it is plain,

(a) Wormius.

(b) Bellonius

(c) Rondeletius.

plain, that Nature generally supplyeth us with the greatest plenty of those things, which are the most useful.

The round SEA-URCHIN or BUTTON-FISH. *Echinus orbicularis*. Here are several Species hereof. The first I shall name is the *Edible Button-Fish*. These have very great Prickles, with *Seats* or *Bases* proportionable, in five double Orders. And the shells are orbicular. See the full Description in *Rondeletius*.

They were anciently eaten raw before Supper; as *Oysters* are now, and as much esteemed.

The ROUND BUTTON-FISH, with ten Orders of midling Prickles. Of these Prickles it hath five Orders of bigger, and five of less, all Conical at each end, and bounded by ten more. Of this kind, here are some more, others less round. Some also that are *White*, and others *Redish*.

The ROUND BUTTON-FISH, with the least sort of Prickles, and disposed into ten Orders. Of this sort here are *White*, *Brown*, and *Green*. These, Mr. *Lyster* saith, are found in the *English-Seas*.

The GREAT OVAL SEA-URCHIN. *Echinometra Aristotelis*. See the Description hereof in *Calceolarius's Musæum*. The greatest, and so as it were the Mother of all the other kinds; from whence its Name. This here is near $\frac{1}{2}$ a foot long. Its Figure is not orbicular, but comes near an oval or flatish Heart.

The MARE-MAIDS-HEAD, or lesser Oval SEA-URCHIN. *Echinus Spatagus*. This differs from the former, only or principally in being much less; seldom exceeding the bigness of a *Hens Egg*. These are shells rarely found.

The *Sea-Urchin* maketh its progressive motion with its Prickles which it useth instead of Feet. (a) And it is affirmed, by *Moufet*, particularly of the *Great Oval*, that it moveth in a spiral line.

(a) Arist. H.
Anim. lib. 4.
c. 5.

The SEA-EAR. *Auris marina*. It hath its Name from its Figure, somewhat like a Mans ear. The inside is of a Pearl-colour, the outside brown and ruged with many small radiated and spiral wrinkles running across. There are several Holes on one side it, through which the Animal admits and expels the water at pleasure. Here are three

of them, whereof two, are each about five inches long. This shell is found in abundance near *Garnsey Island*. (a) The *Goldsmiths* in *France* (b) split them into thin Plates, wherewith they beautifie *Cabinets*, and other *Works*.

(a) Lyft. lib.
de Cochl.
(b) Bellonius

The VAULTED-LIMPET. *Patella concamerata*. No where described, that I know off. It seems to be of the *Limpet-kind*, or to stand betwix this and the *Sea-Ear*. It is in a manner a half Oval split by the length, which is an inch and half. It hath a *Navle*, as the *Sea-Ear*, winding to one side. The Back is rough, and of a whitish ash-colour. Within, very smooth and of a pale purpleish white. The hinder half is vaulted with a most white Plate, joyned to the sides $\frac{1}{4}$ of an inch below the edges.

The EVEN OVAL LIMPET. See the figure hereof in *Johnston*. That part which may be called the *Navle*, stands a little above the convexity of the shell. The *Seat* of the Animal is shaped so, as in some sort to resemble the *Stag-Beetle*. The edges thereof curiously angul'd, parti-colour'd white and bay. The edge of the shell is perfectly Oval, and the inner Margin of a pale blew. Here are two fair Ones of this sort, about three inches long.

The PEARLY OVAL LIMPET. The inside hereof is of a curious pearl colour, with some rays of purple. It hath a greater convexity than the former, and is waved all round about.

(c) Lib. de
Aquat. &
Terr. c. 50.

The OVAL LIMPET, with very deep furrows round about. Whereby the edges also are very angular. The *Seat* of the Animal white. *Columna* (c) seems to have described this by the Name of *Lepas sive Patella maxima striata*.

The LEVEL-LIMPET. *Patella Plano-convexa*. The sides of this lie level betwixt the edges and the top. 'Tis also furrowed, but not deeply. Yet the edges are more angular than of the former. The *Seat* of the Animal is white, surrounded with a kind of double Glory. The outer Margins are of a blackish shining Bay. There are several small ones of this sort, having the inner side streaked with black and yellow.

The CONICK-LIMPET, with the top high, and the sides and edges level round about.

The CONICK-LIMPET, with part of the edge raised toward

toward the top or *Navle* of the shell. This sort I meet with no where. Without of an ash-colour, rough with wrinkles in rays, and waved Circles. Within smooth, the Margin white, about $\frac{1}{4}$ of an inch broad; the *Seat* of the Animal yellow spread out both ways.

The Animal it self is headed and horned like a *Snail*. See *Bellonius's* Description. Our *Fishermen* use the ordinary kinds to bait with, who find them every where in our Seas on the Rocks near the *shore*. (a) If they feel themselves touched, they stick so very fast to the Rock, that they can hardly be loosened thence without a Knife. (b)

(a) *Lyftri*
lib. de
Cochl.
(b) *Wormi-*
us.

CHAP. II.

Of SHELLS Double and Multiple.

NOTE, That when I speak of the *Base*, I mean, that part on which the Teeth, Joynts or Hinges stand. When of the *Navle*, the pecked end of the shell, which for the most part stands behind the *Base*; as also that part which answers to it, where it doth not. When of the sides, not the Concave and Convex, but the edges produced from the *Navle* on the right and left.

The SEA-WING. *Pinna*. Each *Valve* is very like in shape to the Wing of a large Fowl, from whence I name it. Where broadest, near $\frac{1}{4}$ of a yard over. In length two feet: being the largest and longest of all the shells that I know. The two *Valves* are naturally ty'd together with a sort of *Tow*; whereby they are also fastened to some Stone or other Body under Water. The Animal is very good meat.

The SEA-OYSTER; in distinction from the common, which may be called the *Shore-Oyster*. *Ostrea Pelagia*. Here are several of this sort, all of them but small. *Rondeletius* saith, that in *India* they are sometimes a foot long.

The CHESTNUT-OYSTER. I meet with it no where described or figur'd. It is near two inches and $\frac{1}{2}$ long, of an Oval Figure, and somewhat writhen. The outside is of a dark-brown, very uneven with large Oval Furrows. The
inside

inside of a dark-Bay ; from whence I name it. Held up against the light, it looks like a deep Tincture of *Saffron* or *Myrrh*. The *Seat* of the Animal is rough with small frizled or undulated Wrinkles, furrounded with a smooth Margin, on one side above $\frac{1}{2}$ an inch broad, after an odd fashion turn'd or spread outward, Convex inward, and entirely encompassing the *Navle* of the shell. Here are three or four smaller Ones of the same *Species*.

A SHELL with the *Base* a little cover'd. *Ostrea Basi Cooperata*. I find it not described. It's somewhat doubtful whether a *Limpet* or an *Oyster* shell. I think the latter. The *Navle* stands obliquely. But the sides make equal or similar lines from the *Base*. Somewhat above an inch in length, very Convex, the Margin oval. The *Base* is as it were shaded with a transverse Plate $\frac{1}{8}$ th of an inch broad. The inside, blew ; the outside speckled below with tawny and black spots, above with white and purple, with very small lines running across or Net-wise.

The PLAIN ROUND ESCALLOP. *Pecten Valvis rotundis & æqualibus*.

The ROUND FURROW'D ESCALLOP, with smooth Shells or *Valves*.

Another of the same sort, with rough shells.

The LONG ESCALLOP. These and the other kinds seldom exceed the bigness of the palm of the Hand. But
 (a) P. 90. *Linscholen* (a) saith, That by *Malacca* are shells found like *Scallops*, so big, that two strong men can hardly draw one of them, with a leaver, after them. *Scallops* will move so strongly, as oftentimes to leap out of the *Catcher* wherein they are taken. (b) Their way of leaping or raising up themselves, is, by forcing their under *Valve* against the Body whereon they lie. (c) They are taken amongst other places, near *Portland*, and at *Purbec* and *Selfey*, where they are excellent good. *Rondeletius* prefers them, for Meat, before *Oysters*.

(b) Arist. H. A. lib. 4. c. 4.

(c) Scal. exerc. 219. S. 1.

COKLE. *Pectunculus*. Here are of these, both White, Red, and speckled with various Colours.

The CORALLINE SCALLOP. *Concha Corallina*. I call it a *Scallop*, because it seems to be but another sort without ears. This is only waved. See *Rondeletius's* Description. He saith 'tis rarely found, and seldom, except
 in

in the *Dog-days*, after long Southern Winds, cast on the shore.

The CORALLINE-SCALLOP both waved and wrinkled; the Wrinkles and Waves standing not across, but the same way.

The long GAPING COCKLE. *Chama*. 'Tis thinner and more easily broken than most other shells. The *Valves* are seldom or never close shut. The sides are produced from the *Base* by similar lines, as in the *Cockle*, and the figure of the shell oblong: from whence I have taken leave for its Name. Whether the Anatomy of the Animal would suggest a better, I know not. This here is about an inch and $\frac{1}{2}$ long; and of an ash-colour.

Of this, and probably all the other *Species*, it is omitted by those that describe them, that from each of the two Joynts at the *Base*, is produced a kind of bony *Epiphysis*, about $\frac{1}{4}$ of an inch long, thin, sharp and flexible: whereupon some of the muscular parts of the Animal seem to be fastened, for the restraining the opening of the shell from any inconvenient degree.

The BLACK GAPING COCKLE. This is somewhat lesser than the former, and of a rounder Figure, radiated, and the edges wav'd. As thin as the former, and hath the like *Epiphyses*.

This sort, when the *South-Wind* blows, rise up to the top of the Water, and setting their two shells wide open; with the one under them, as a Boat; and the other, on one side as a Sail, they scoure along. (a)

The Broath of this *Shell-Fish* is affirmed by *Dioscorides* to be both *Laxative* and *Diuretick*. They have a kind of biting tast, like *Pepper*; and are therefore called, by the *French*, *Des Flammes*: and the *Italians*, for the same reason, call them, *Peverazas*. (b)

The SHEATH-FISH; commonly so called from its similitude to the sheath of a Knife. *Solen. Unguis*. As the *Sea-Wing* is the longest, so this is the most expanded of all Shells; though usually call'd *A long Shell*, but improperly. For it may be noted, that the length of a shell is properly from the *Navle* to the edge directly opposite; the breadth, between the two sides thence produced, which in this Shell are the two ends: as if you should crush the

(a) Bellon:
H. Anim. lib:
15. c. 12.

(b) Bellonius

the two ends of a mouldable substance of an Oval figure, till you made the two sides become the two ends. Some of these are $\frac{1}{2}$ foot wide, or more.

(a) Lyfter.
de Conch.

This Shell is found on the shore near *Scarborough* after long *Winter-Storms*. (a) The Animal shines much in the dark, especially when the shell is full of liquor, the drops whereof glister where ever they fall; by virtue of which, it is most probable, that the Flesh it self becomes shining. (b)

(b) Pliny.

The ROUND-OYSTER, with similar sides produced from an oblique *Navle*. The Convex is very white, and finely wrought with circular, and radiated lines across.

The MULTARTICULATE OYSTER with a bended *Base*. The Convex is smooth, and stained with *Chestnut* upon *white*. Its *Base* is in a manner semilunar, produced a little forward from the *Navle*. Upon this *Base* are fourteen, sixteen, sometimes twenty small Joynts, standing obliquely, and also in a bended line answerable to the *Base*. To the two ends whereof, the *Seat* of the Animal is contiguous. The fore-edge and Margin are furrowed and toothed within. Here are four of this sort.

The BROAD-OYSTER, with similar sides.

The FISTULAR OYSTER. *Concha Valvis Fistulosis*. Described by *Columna* with the name of *Concha exotica marginis in Mucronem emissa*; who hath also figur'd it well. It hath not only several Furrows or Gutters reaching from the *Navle* to the edges round about, but the Furrows are also cover'd over, and so properly fistular; whence I have nam'd the Shell. The circumference or edge is also prolonged into several Peaks, which have some kind of likeness to Sword-points. But *Columnas* name is somewhat absurdly given, unless instead of divers, there had been one only.

The MULTARTICULATE OYSTER, with a strait *Base*. Described and figur'd by *Columna* with the name of *Concha πολυλεπτογίγλυμοις*. Here are two of this sort. The chief marks hereof are, that it hath a great number (twenty or more) of slender Joynts, about $\frac{1}{4}$ of an inch long, placed parallel, upon a strait *Base*.

The ASSE-FOOT OYSTER. *Ostrea Gaderopoda*, So called

called from its Figure. Described by *Bellonius*. Its chief Characters are, that it hath very great Joynts, like the eye-teeth of a Man, and upon a strait Base. It grows not loose, as other *Oysters*, but fixed to the Rocks under Water: and therefore in those Seas only, which ebb and flow not, (a) as (a) *Bellonius* the *Ægean*, the *Hellepont*, &c.

The CORALLINE-OYSTER. *Spondylus Echinatus* & *Corallinus*. I meet with it no where. 'Tis of an unusual Figure. The Base hereof is strait, and an inch and $\frac{1}{2}$ over. In each end hereof is a roundish cavity, doubtless for the reception of answerable Joynts. An inch and $\frac{1}{2}$ or more beyond this, the *Navle*, which is a little bended upward, smooth within side, and scaly without. The inner part of the shell is exceeding white, smooth, hard, and thick. The outward Crust thinner, yet also very hard, wrinkled, spiked, and of the colour of red Coral. Part of it is broken off.

MOTHER of PEARL. *Concha Margaritifera*. See a true, and good Figure hereof in *Calceolarius's Musæum*. It is naturally within of the same colour with that of a Pearl. It is sometimes seen with a pearly Knob growing within it, as in this here, near the centre. But the Pearls themselves grow within the Animal: within the Flesh (as *Athenæus* (b) affirms) as that sort of Kernel in a Hog, called *Grando*. (b) Quoted by Rondeletius. Although more probably in the Stomach, as *Bézoar*, and the like, in other Animals. (c) As Eggs in the Belly of a Pullet, saith *Tavernier*. (d) The Shell is said to be found near the Island *Borneo* sometimes so big, as to weigh forty seven pounds. (e) (c) Philos. Trans. N. 101. (d) Indian-Voyage. (e) Charl. On. Zoic.

Take *Mother of Pearl*, the small *White Venus-Shell* of each equal parts. Pour upon them, being first powdered, the juyce of *Lemons*, and let them stand together (a day or two) then filtre the liquor, and keep it, as the best wash for the Face in the World. (f)

MOTHER OF PEARL, with the backside cover'd all over with those little Shells called *DENTALIA*, as having some little likeness to Teeth: that is to say, White, Smooth, Conick, and bended *Tubes*, which grow to this and other Shells. See *Gesner* of *Entali* & *Dentali*, p. 940. The inside of the *Sea-Ear*, of some sorts of *Limpets*, and of divers other Shells, are commonly sold in Shops for true *Mother of Pearl*.

ORIENTAL PEARL, round, and with a good Water.

PEARLS of the bigness of a large *Peas*, and perfectly round, but without a Water.

ROUND PEARLS, of divers Colours, *sc.* White, Ashen, Brown, Red, and Bay.

PEARLS of divers Figures, *sc.* Oval, Cylindrical, Flat, Conick, Twins, and three and four together.

WELSH-PEARL. Given by the Honourable Mr. Boyle. They are most of them flatish, and of a shining blackish colour.

Heretofore, the most rich fishing for *Pearls*, was at the Island *Margarita*. Whence their Name. (a) At this time the chief Fishings in the *East-Indies* are three, the *Persian-Gulph*, on the Coast of *Arabia* the *Happy*, and in the Island *Ceylan*. In the *West-Indies*, five; along the Islands *Cubagna*, and *Manguerita*, at *Camogete*, *Riodela Hacha*, and *St. Marthas*. They fish in twelve-fathome Water, five or six leagues off at Sea, *Spring* and *Fall*. (b)

(a) Gefner.
(b) Tavern.
Indian-Voy-
age.

Of *Pearls* we have these following Preparations, and probably the first, of all, the best, if perfectly ground.

<i>Pulvis, Essentia, Flores,</i>	} <i>Commune</i> <i>Butyraceum</i> <i>Plumaceum</i> <i>Riverij.</i>
<i>Sal, Tinctura, Magisterium,</i>	
<i>Liquor, Arcanum,</i>	

The PEARLY OYSTER. *Concha Cœlata*. 'Tis shaped much like the *Mother of Pearl*, but is somewhat oblong. It hath also a pearly-colour within-side; but of a more leaden-water.

The SQUARE-MUSCLE. *Concha Rhomboidea, s. Musculus striatus Rondeletio*. That part where the *Valves* joyn, *i. e.* the *Base*, is long, not rounded, but strait, and standeth erect or perpendicular, by which it may be distinguished from other Shells. It lies in the deeper parts of the Sea, and is rarely found.

The RUGGED-OYSTER. Not described, that I know. The Joynts hereof very shallow. The *Navle* very oblique. The Sides thence produced, dissimilar. The Back cut with round Furrows; and the Furrows edged, and beset with a number

number of little short prickles. It is of a dull ash-colour, roundish, and somewhat bigger than a *Half-Crown*.

The SAND-MUSCLE. *Tellina*. They live much in the *Sand*; for which reason, unless they are shaken long in water, before they are boyl'd, they are very gritty. (a) At *Rome*, they are esteemed a pleasant Junket. (b) Here are several shells of this sort.

(a) Rondeletius.
(b) Wormius.

The TOOTHED-MUSCLE. It is of a roundish Figure, and the edges, especially before, toothed almost like a *Saw*.

The GREAT WAVED-MUSCLE. Well described and figur'd by *Columna* with the Name of *Concha Maxima marmorea exotica imbricata*. It is also called *Concha Tridachna*: because it contains as much meat, as a Man can swallow at thrice. A certain number put for an uncertain: for some of them hold meat enough almost to fill a mans belly, being a foot in length, or rather in expansion or breadth; this here $\frac{3}{4}$ of a foot. The Back is waved with broad and deep Furrows, and the edges indented answerably. It is (c) commonly found in the *Red-Sea*.

(c) Bellonius

The LONGISH-MUSCLE, with rough Wrinkles or Rays.

ANOTHER with smooth Rays, i.e. *Concha Rondelet. Striata* 3.

The ROUNDISH radiated *Muscle*.

The PLAIN LONGISH MUSCLE. This hath no Rays on the Back.

The PLAIN BROAD MUSCLE. Of these here are two sorts, the one less, the other more expanded. This latter is by *Rondeletius* called *Concha longa*; mistaking what is properly the breadth, for the length of the shell. Of this (d) Shell, is commonly made a sort of *Lime*.

(d) Rondeletius.

The BROAD-MUSCLE, with deep Joynts.

The TOOTHED BROAD-MUSCLE. Described and figur'd by Mr. *Lyster*, (e) with the Name of *Tellina intus ex Viola purpurascens*, &c. 'Tis a little shell not much above an inch broad, the edge indented round about with curious small Teeth; and having within-side a faint purple blush.

(e) Lib. de Conch. Tit. 35.

ANOTHER little broad *Muscle*, without Teeth, or even-edged.

A BLOBLIP'D-SHELL, which seemeth to be a kind of *Muscle*. I find it no where. Here are several single shells of this sort, but not one pair: which makes me somewhat doubtful what to make of them. Most of them have about an inch of expansion. The Concave in the inside, is triangular, with small strait transvers Wrinkles, one Angle obtuse, two acute. From the two longer sides of the triangle, the Margin is spread out, and on one side as it were doubled backward. It hath also one, sometimes two Joynts, very deep, and for so small a shell, remarkably strong.

The Natives of *Brasile* use *Muscle-shells* for *Spoons* and *Knives*. (a) *The ashes of Muscle-shells*, saith *Wormius*, are of a *Caustick-nature*. As if it were peculiar to this shell. Whereas the shells of all sorts of *Shell-Fish*, being burnt, obtain the like. Most of them, being so order'd, and powder'd, make excellent good *Dentifrices*.

(a) Barlæus,
de rebus
gestis in
Brasilia.

Hitherto go the Double Shells, or with two *Valves*. There remain some which are made up of several shelly pieces conjoyn'd to make one Concave-shell: as

The Conick CENTRE-SHELL. *Balanus major*. Described by *Rondeletius*, and others. It is in shape somewhat like a *Tulip*, the several shelly Plates which compose it, being pointed at the top, and standing together, as so many leaves. They always grow fixed to some other Body. When boyl'd, they are a delicate sort of Meat.

The SPUNG-CENTRE-SHELL. *Balanus Spongiorum*. So I name it. Commonly, but somewhat absurdly, called *Lapis Spongiæ*. For being well observed, they appear to be little *Centre-Shells*, which probably never grow very big; and wherein the leaves seem to be a little more separate, than in the former *Species*. They look just like small petrifi'd Buds of Trees.

A small *Centre-Shell*, growing upon a Branch of *Coral*.

The FLAT CENTRE-SHELL. *Balanus compressa*. Commonly called the *BARNACLE-SHELL*; and *CONCHA ANATIFERA*. Because supposed to be the Egg of the *Barnacle*. And by some (b) it is confidently deliver'd, that in the *Orcades* there are certain *Worms* grow in Hollow-Trees, which by degrees obtain the Head, Feet, Wings and all the feathers of a *Water-Fowl*, which grows to the bigness of a

(b) Hector
Boethius
quoted by
Gesner, and
our Country-
man Dr. Tur-
ner.

Goose.

Goose. *Scaliger* also describes this (supposed) Bird within this shell. (a) And with respect to so worthy a Person as Sir Robert Moray (who never meant to deceive) I my self was once induced to publish his Description of the same. (b) But having examined the Shell it self, I am of Opinion, That all that is said of a Bird, is fabulous. *Bartholine* would have it to belong to a kind of *Cancellus*. But I rather agree with *Columna*, that it is a sort of *Centre-Shell*; as being fixed in like manner upon it's *Base*, and composed of several shelly parts.

(a) Exercit.

59. toward

the end.

(b) Philos.

Transact. N.

(c) Histor.

Cent. 6.

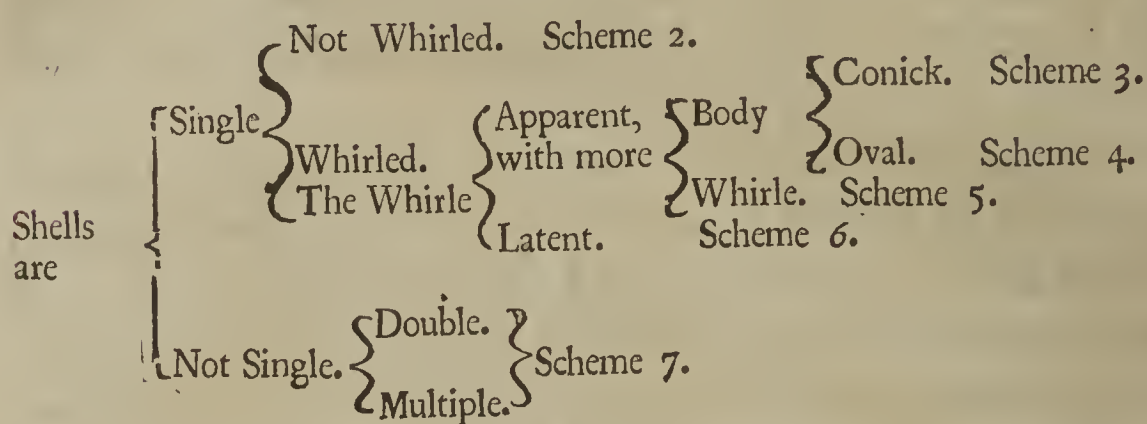
Of these Shells two *Species* are here preserved. One of them consisting only of five shelly pieces. Two greater, almost like little *Muscle-shells*. To these are joyned, edge to edge, and oppositely, a much lesser pair, *sc.* in such manner, as their *Base* stands over the *Cone*, and their Points descend half way towards the *Base*, of the greater pair. Both these pairs are on one side hem'd in with a fifth piece, narrow, long, and inwardly Concave, almost like a *Larks* Heel. The Neck to which they are fasten'd is here wanting. This *Species* is figur'd, and in some sort described by *Wormius*. But the Figure in *Calceolarius's* *Museum* answers not.

The FLAT CENTRE-SHELL with the Scaled *Base*. *Balanus compressa* & *Squamata*; so I call it. This *Species* is in some sort figur'd by *Rondeletius*. But his Description worth nothing. 'Tis near an inch long, and $\frac{3}{4}$ of an inch broad at the *Base*, where it is somewhat narrower than in the middle. Whitish, and with some Rays of blew. It consists of five greater pieces, whereof the middlemost pair, the greatest and the longest. The lesser pair are joyned to them edge to edge, reaching half their length, but not oppositely with their Points downward, as in the former *Species*, but upward. The fifth piece not joyned to this lesser pair, as in the other *Species*, but to the opposite edge of the greater. Round about the *Base* of the Shell several little pieces, some bigger and some less, stand after the manner of *Scales*, with their points also forward. So that it looks almost like a great *Bud* crushed flat. 'Tis joyned to a *Neck* about $\frac{3}{4}$ of an inch over; an inch, sometimes more, or less, in length; of a brown colour, rough, and composed of an innumerable company of small Knobs, almost like those on some Fishes Skins. Several Shells, by the like Necks, commonly grow all together in a Cluster. I have

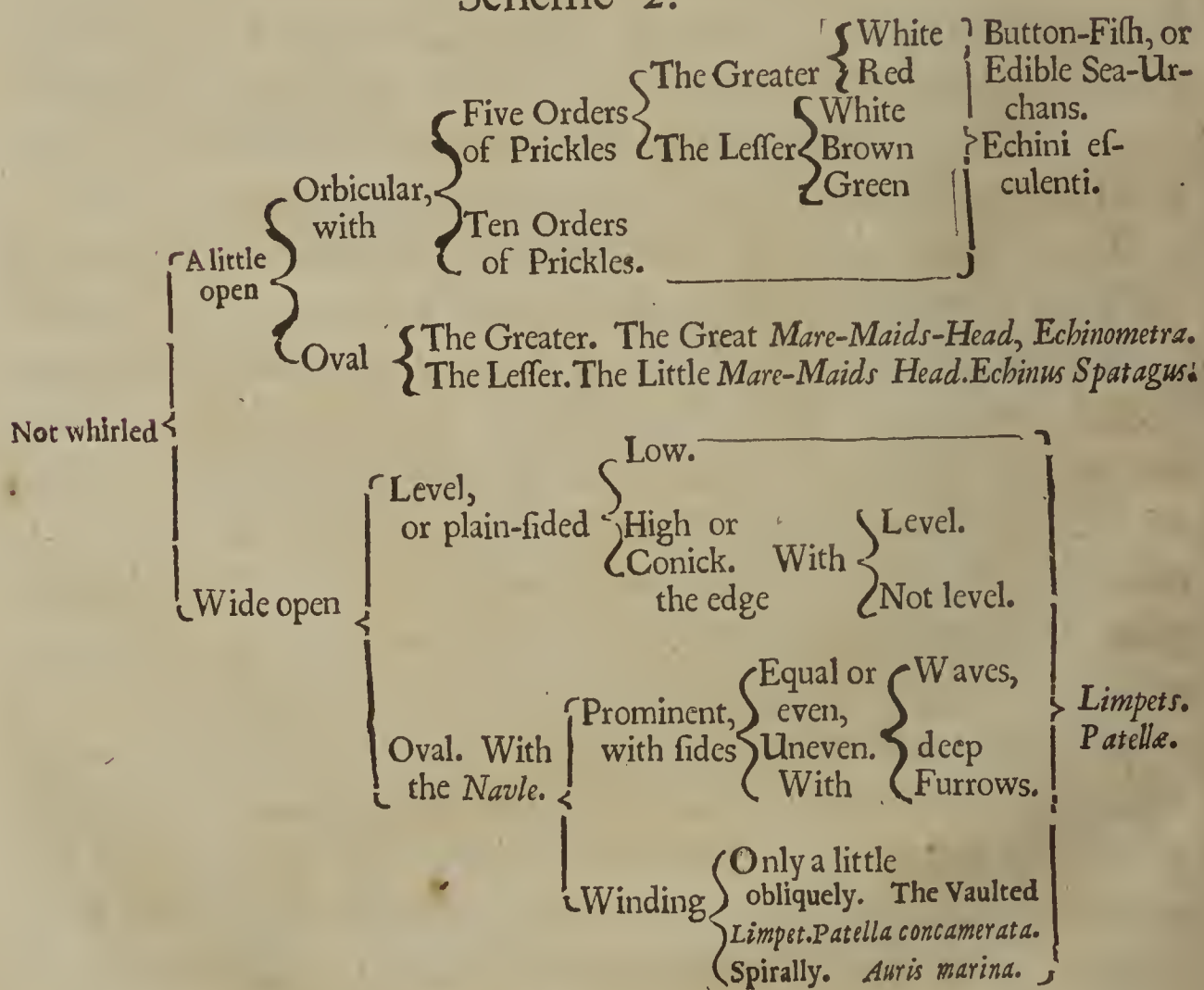
I have seen some of these *Shells* perfectly formed in all their parts, not much bigger than a *Cheese-Mite*.

Thus far the Titles and Descriptions; the Schemes follow, which take in all, save one or two of the *Sub-Species*: and wherein the Order is a little more corrected.

Scheme 1.

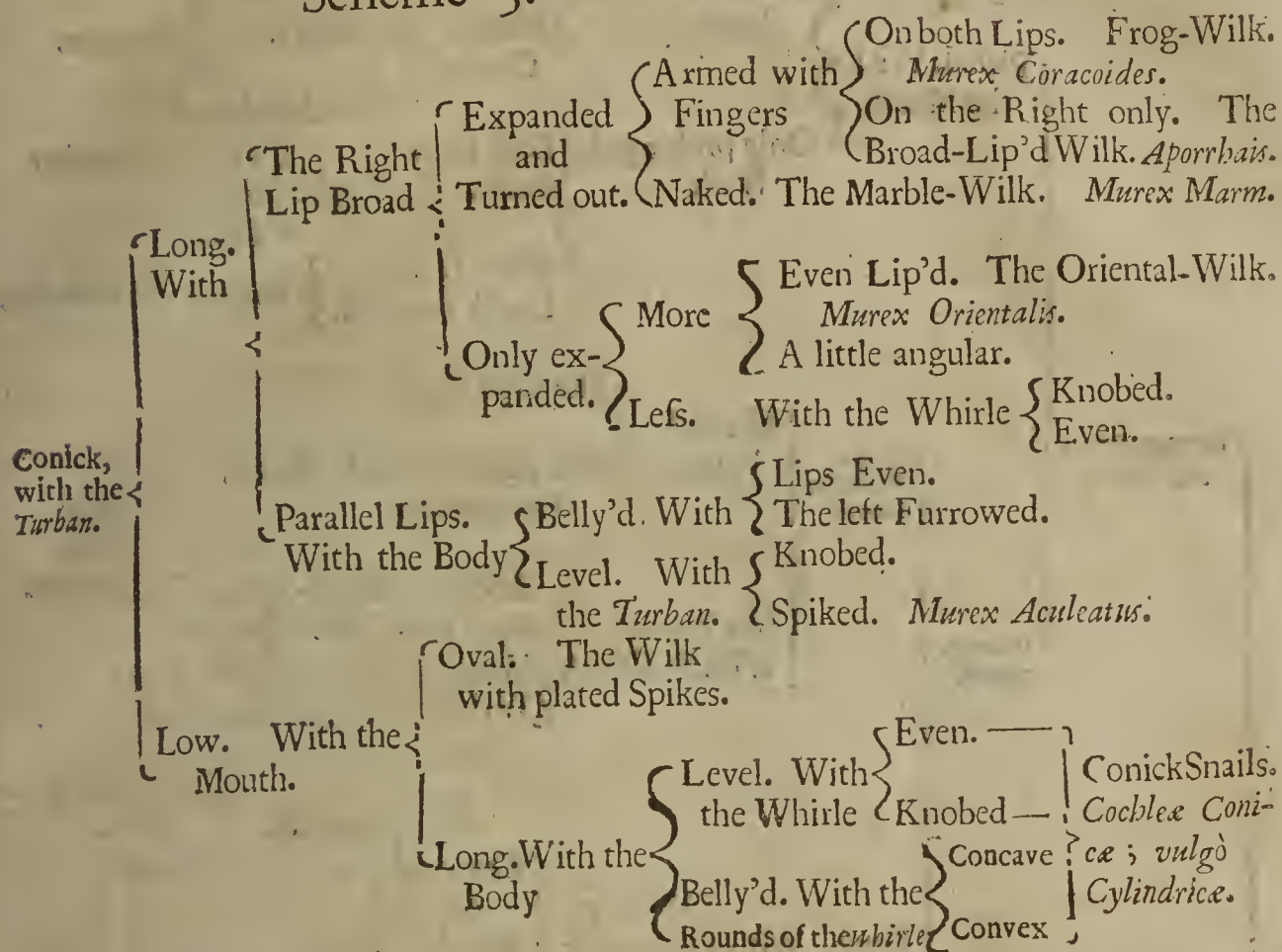


Scheme 2.

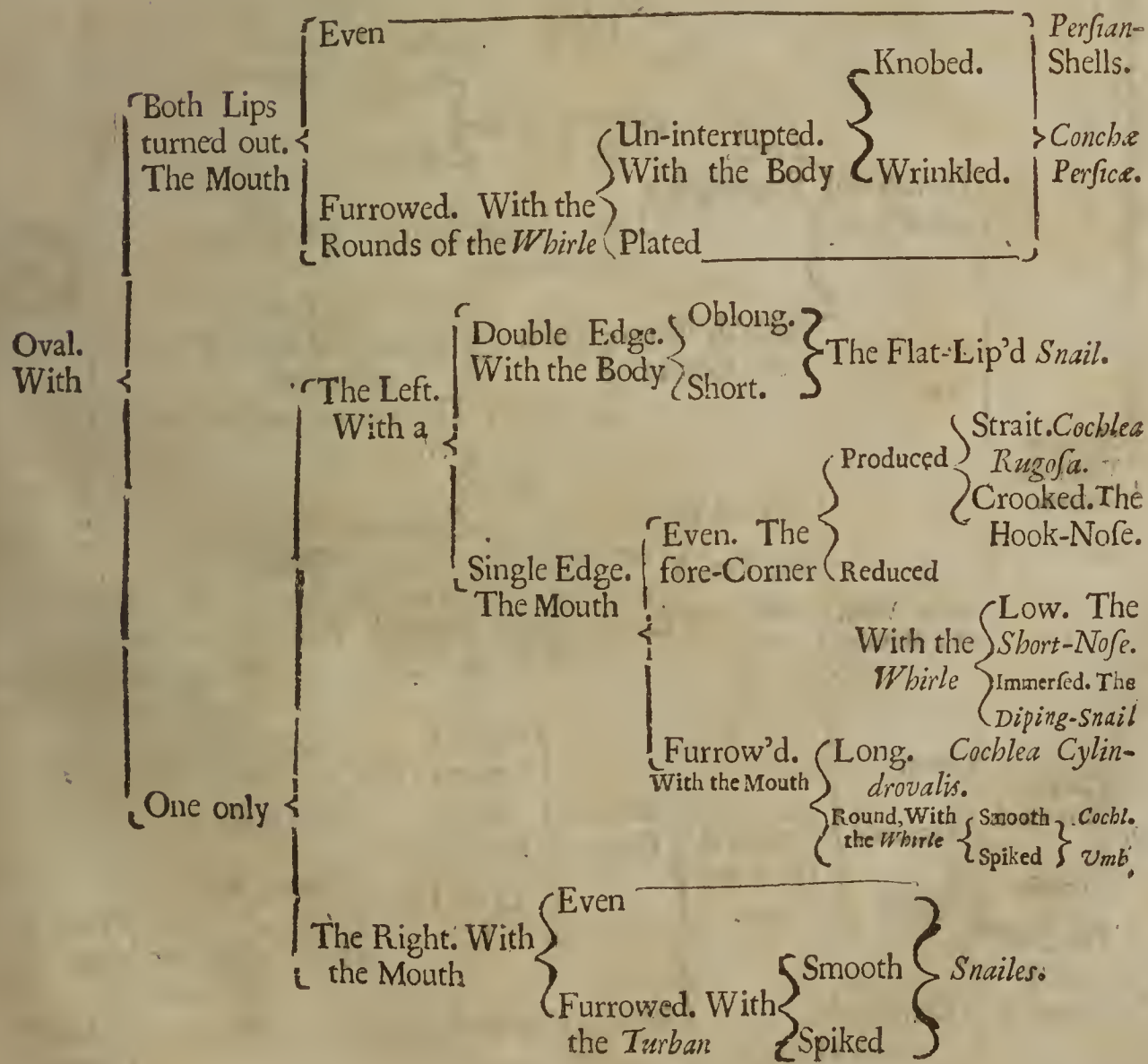


Scheme 3.

Scheme 3.

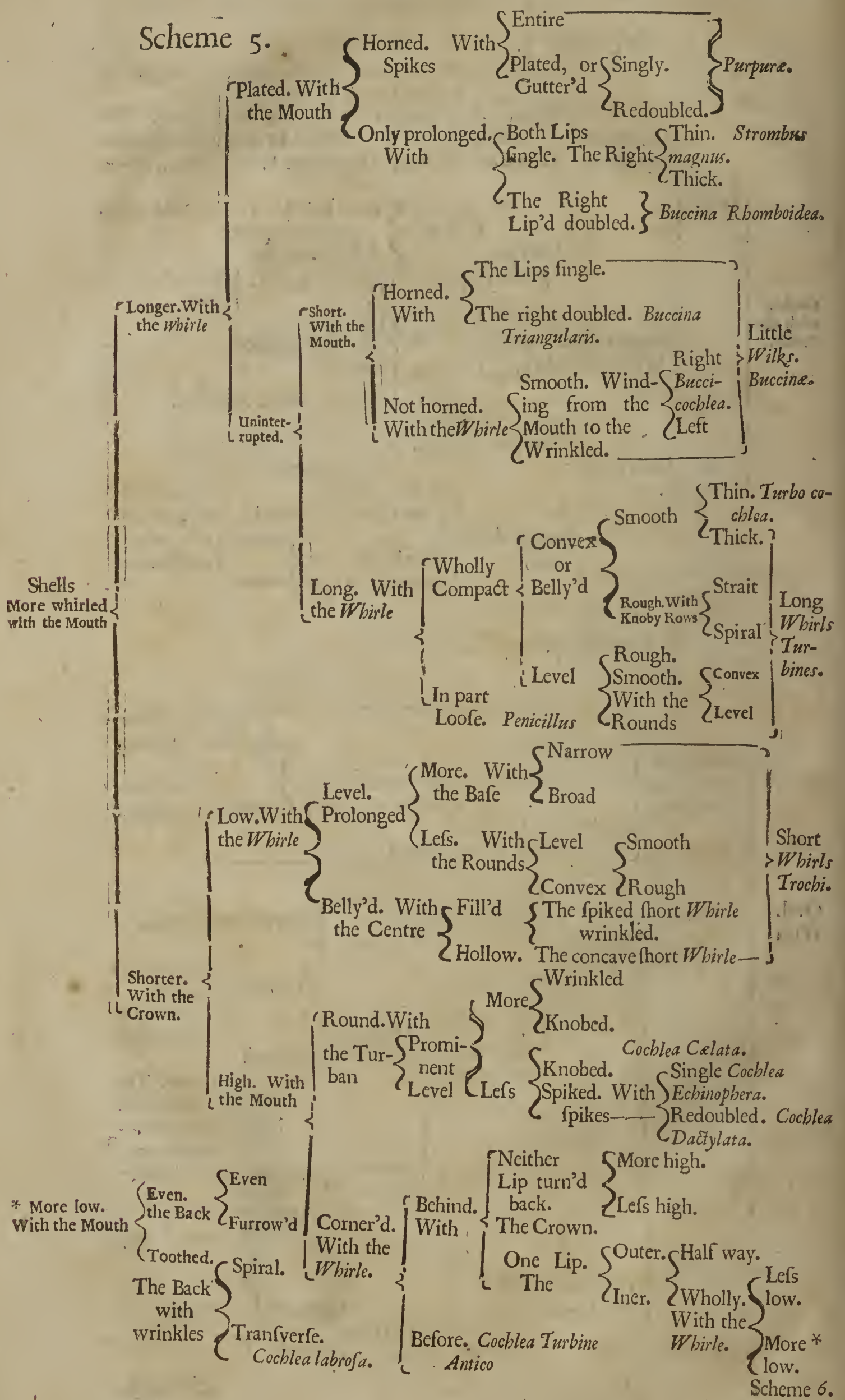


Scheme 4.

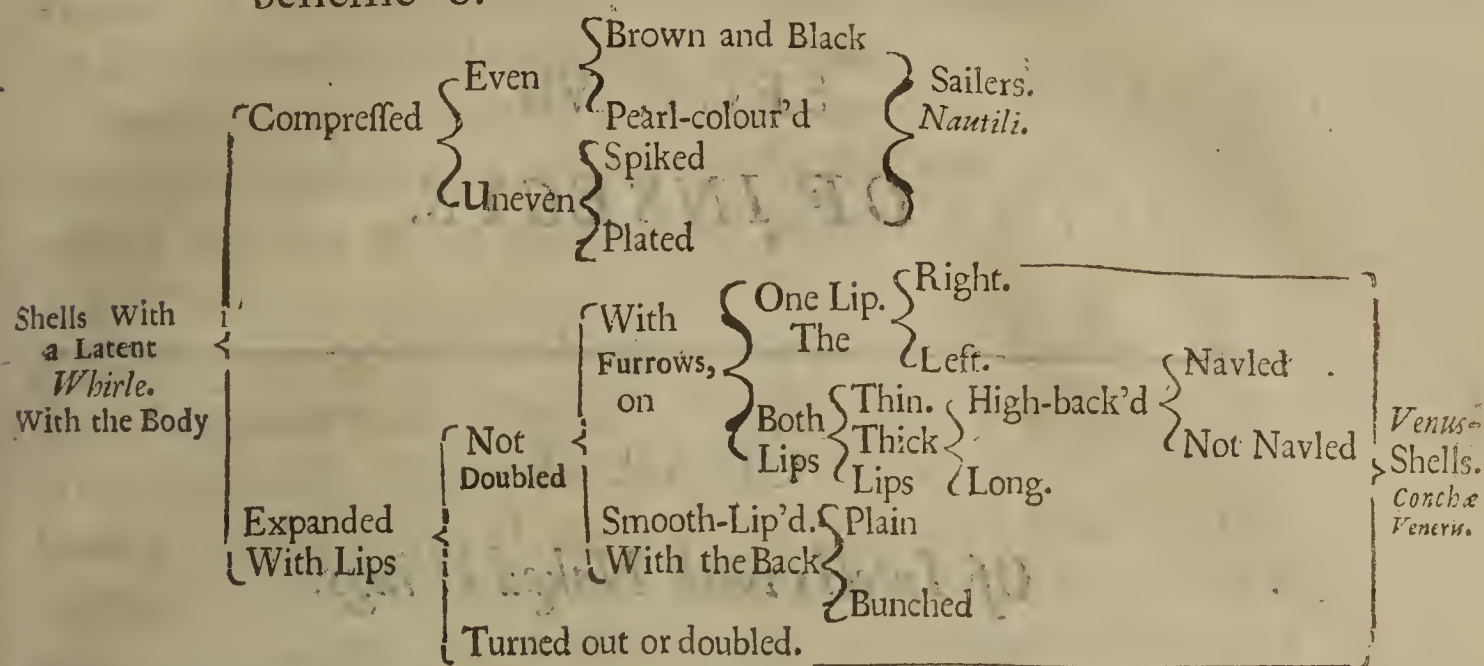


Scheme 5.

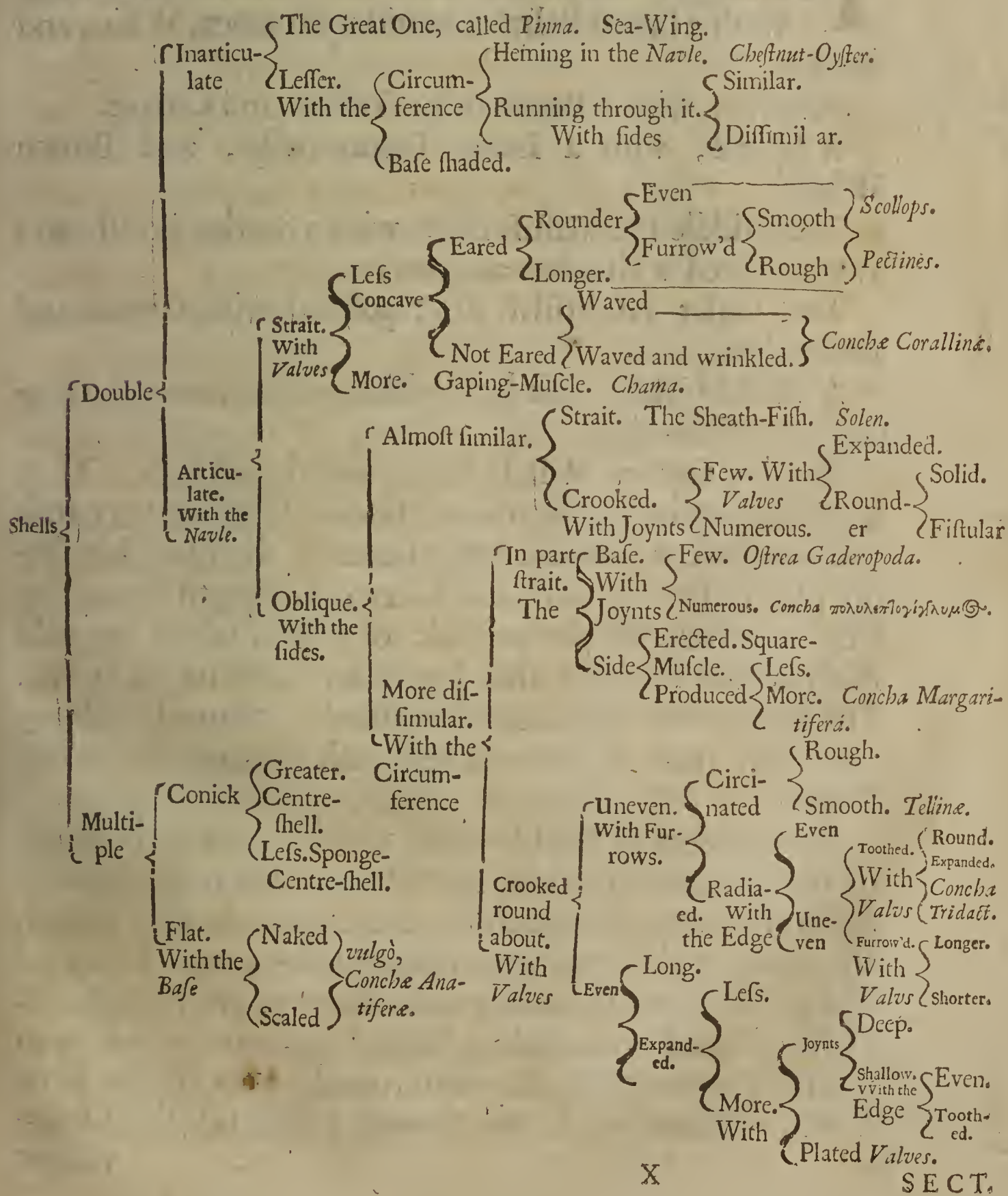
Scheme 5.



Scheme 6.



Scheme 7.



SECT. VII.
OF INSECTS.

CHAP. I.

Of Insects with Naked-Wings.

THe Bigger HUMBLE-BEE. *Bombylius major*. First, With a broad-Belly, colour'd with Ashen, White, and Brown.

Another, with a Broad-Belly, Yellow and Citrine.

A Third, with a Long Tawny-Belly, and Brown Wings.

The Middle HUMBLE-BEE, with a Scarlet Breast, and Wings spotted with white and brown.

The Lesser HUMBLE-BEE, painted with Citrine and Iron-colour.

A WILD-BEE, with her Follicle or Bag, near the bigness of a *Wrens-Egg*.

Another sort of WILD-BEE, with their BAGS. They are about $\frac{1}{2}$ an inch long, of a Cylindrical Figure, very thin and transparent, like the inner Coats of the Eye. Admirably placed, for warmth and safety; *sc.* length-ways, one after another, in the middle of the *Pith* of an old *Elder-Branch*, with a thin boundary betwixt each Bag. The little *Bees* are somewhat thicker than the *Flying-Ant*; and their Bellies marked with four or five white Rings.

Another sort of WILD-BEE, which breeds in the stocks of old *Willows*. Curious to observe. They first bore a *Canale* in the Stock, which, for more warmth, they furnish afterwards with Hangings, made of *Rose-Leaves*, so rowled up, as to be contiguous round about to the sides of the *Canale*. And to finish their Work, divide the whole in to several Rooms or Nests, with round pieces of the same leaves. Hereof see in the *Philos. Trans.* (a) the Observations

vations of Dr. *Edm. King*; whereto some others are added by Mr. *Willughby*, and explained by Figures.

Some parts of the NEST of another WILD-BEE. Not much unlike the first of those not inelegant figures, which *Johnston* gives under the Name of *WESPEN-STOCK*.

The under or hinder Wings of a Bee, are the least; that they may not incommode his flight. (a) The Honey-Bag, (a) Mouf. de Insect. cap. 1. is the Stomach, which they always fill to satisfy, and to spare; vomiting up the greater part of the Honey, to be kept against *Winter*. A curious Description and Figure of the Sting, see in Mr. *Hook's Micrography*. In windy Weather, Bees often hold a little stone in their hinder Feet; which serves as a Ballast to make them sail through the Air more steadily. (b) The History of Bees, the best that *Aristotle* (b) Ibid. hath given us, (c) of any one Animal. Of their Polity, (c) Hist. An. lib. 9. c. 40. Generation, Conservation, Diseases, and Use; see also *Moufet*, *Butler*, and a late *Treatise* of Mr. *Rusden*. All that Authors speak of the Spontaneous Generation of Bees, is fabulous. The ashes of Bees are put into most Compositions for breeding of Hair.

A WASPES-NEST. *Vespetum*. Given by Sir *Jonas Moore*, who received it from *New-England*. See the Figure of one in *Johnston*. 'Tis above a foot high, and near a foot over. Composed of a great number of little Cells, as in the *Wild-Bees* Nest, and encompassed with a Cover of the same stuff. All wrought about the Branch of a Tree.

Both this, and the *Bees-Nest* now mention'd, consist of the small *Fibers* of Plants, cohering, altogether as in *Paper*; as may be seen by a Glass. So that the *Stuff* may not be improperly called *BEE-PAPER*.

Another WASPES-NEST, like the former. Given by Dr. *Thomas Allen*.

A LONG-OVAL FOLLICLE (perhaps of a sort of *Hornet*) with this peculiar, That the *Silk* is cover'd with a kind of brown Crust, marbled with blackish Veins.

A NESTED FOLLICLE, or one within another. Here are three of this sort, not fortuitous, but according to Nature. The utmost, is about an inch long, brown, and composed of Stiff-work, with a great many small *Interstices*: so that

it looks just like an Oval-Net. Within this, lies loose another much smaller, of a light Ash-colour, and made like other *Insect-Bags*.

The Polish'd FLESH-FLY; that which is of a blewish-black, like *Steel*.

Another FLESH-FLY with a strong *Proboscis* or Trunk, tawny Wings, black Eyes, bunched Back, brown, long, and sharp Belly, forked Tail, Chesnut Feet, the hinder the longest.

The GOLDEN-EYE. *Musca Chrysopis*, as *Moufet* calls it. The Eye of this Fly is very curious, not only with its golden colour, but in being most elegantly latticed, like that of a *Butterfly*. Whilst alive, they have a very stinking scent.

The OX-FLY. *Musca Boaria. Asilus*.

The WHAME. *Musca Apiformis. Tabani species*.

The WASP-FLY. *Tabani species altera*.

The TWO-BRISTLED-FLY. *Musca Bipilis*. He hath two Bristles upon his Tail, standing level. *Moufet* describes five *Species*.

The THREE-BRISTLED-FLY. *Tripilium*. Of these *Moufet* also describes five sorts. Here are two of them; One greater, the other less. They are most in *May* and *June* before and after the Rains.

Flys, at the end of their *Proboscis*, have a *Piercer* where-
 (a) *Mouf. de* with they broach the Skin. (a) They go only, saith *Moufet*,
 (b) *Inf. c. 10.* with four Feet, using the two foremost instead of Hands. (b)
 (b) *Ibid.* This latter part of his Assertion is true; but the former, con-
 trary to common Observation.

The Hair of the Head being often wet with the water
 of common Flys distill'd in *Balneo Mariæ*, will grow to a
 (c) *Id. c. 12.* very great length. (c) Almost all Flys, being chew'd and
 (d) *Id. c. 12.* swallow'd, cause violent vomitings. (d)

out of Arnol-
 dus.

Two FLY-NESTS; with some of the Flys. They are all black, with four Wings, the Horns and hinder Legs both long, and the end of the Tail thick. Of kin to the *M. Bipilis*.

The Nests are fasten'd or wrought, one, upon a head of *Cypress-Grass*; above $\frac{1}{2}$ an inch long: the other, on the top of a Branch of *Fern*; and is about an inch long. Both oval, and white like Wooll; very porous and compressible,
 like

like a fine *Sponge*; and perforated with several little round Holes. Cutting one of them down the middle, I found, within, the more elaborate Work, consisting of a great number of little oval *Cells*, as in a *Wild Bees-Nest*. These *Cells* are placed in their length transversely to that of the Nest. In each of which, each *Fly* is bred a part from the rest.

The Great BUTTERFLY. *Papilio major*. This is of the second magnitude. The Wings are painted with citrine and black, both in long streaks and spots.

The Great PLUMED BUTTERFLY. The Wings are painted with black and scarlet Rings. In the place of Horns, he hath a pair of Plumes in his Forehead.

Another, with LONGER PLUMES. The Wings of this are spotted with black and tawny.

The lesser BUTTERFLY, with scarlet Wings; the foremost of which are far shorter than the other.

Another, having the Wings speckled with red, yellow, brown and black spots.

Of the larger, middle, and lesser kinds, *Moufet* reckons up and describes five and thirty sorts. (a)

That which seems to be a Powder upon the Wings of a *Butterfly*, Is an innumerable company of extreme small Feathers, not to be discerned without a *Microscope*. (b)

Butterflies, as most *Insects*, saith *Moufet*, are very Diuretick (*urinas egregiè movent*) and with more safety. (c) 'Tis worth the trial.

The Great A D D E R S Boul; from the strait long figure: *Dragon-Fly*, from the colour and bigness. *Water-Butterfly*, because they most frequent Rivers and watry places. *Perla*, from its colour. *Libella*, from its figure, when the Wings are spread out. In this, the *Bases* of the Wings are spotted, the Belly almost triangular, the Tail pointed, painted with black and gold-colour.

Another GREAT ONE, with silver Wings, a golden Mouth, a green Forehead, Chesnut Eyes, a round Belly painted with citrine and black.

A THIRD, with citrine Wings, a green Back, and a yellow Belly. It is furnished both with Horns and Plumes in the Forehead.

The Middle ADDERS Boul. It is of a dark-Green.
The

(a) Latter part of C. 14.

(b) See Dr. Powers Microsc. Observ. and Mr. Hook's Micrography.

(c) Cap. 14.

The Head small, the Chest or middle part short, the Belly very long and slender. *Moufet* reckons up in all about 20 sorts.

The LANTHORN-FLY of *Peru*. *Cucujus Peruvianus*. A quite different *Species* from that described by *Moufet*. And, with respect to his Wings, is no way of kin to the *Beetle* or *Scarabeus*-kind, but rather the *Locust*. I find it no where described.

'Tis above three inches long, and thick as the *Ring-finger*. His Head, in bigness and figure, admirable; near an inch and half long, in the thickest part of it above half an inch over. From the Eyes forward it first swells or bellies out, afterwards contracts into a smaller, yet blunt end. 'Tis also crowned with a broad blunt knob, and the end refimated or bended upward. In its Circumference it hath seven low Ridges or Angles, marked with so many black lines, an eighth line being added betwixt the two uppermost Angles. The greater part hereof (now) betwixt yellow and straw-colour. Yet stained with brown and red streaks and spots, neatly ranged, especially on the top and both sides. It seems, at least in the fore part, to be hollow, and almost like a Bladder blown up.

The Eyes, for the bigness of his Body, very small. Of a dusky-colour, yet glossy, and Sphærical, looking just like two brown Seed-Pearls. Under these stand two small round parts, open at top, which seem to be the Roots of a pair of Horns: unless any will conceit them to be his Ears. Both these and the Eyes are guarded with a semilunar Ridge.

The other parts, being more or less spoil'd, cannot be perfectly describ'd. His *Proboscis* sufficiently strong, about $\frac{1}{2}$ an inch long, and as thick as a stitching or *Taylers* Needle. The Feet all broken off. His Body an inch and $\frac{1}{2}$ long, not much exceeding the length of the Head; about $\frac{3}{4}$ over. Composed, besides the Shoulders, of about ten Rings. He hath four Wings, almost like those of the *Locust*; the uppermost somewhat stronger and stiffer than the other. Both Pairs are of a dun-colour, sprinkled with dark-brown spots. They are extended considerably beyond the Body; yet the ends are worn off.

That which, beside the figure of the Head, is most wonderful

wonderful in this *Insect* is the shining property of the same Part, whereby it looks in the Night like a little Lanthorne (*Lamphorne*.) So that two or three of these fasten'd to a stick, or otherwise conveniently disposed off, will give sufficient light to those that travail or walk in the Night.

A BAULME KRICKET. *Cicada*. It is the fourth in order described by *Moufet*. The upper Wings of this *Insect* also are stiffer than the other, like those of the *Locust*. But that which is most remarkable, is the broad Hood which is spread over his Head and the top of his Shoulders. It is a Stranger here in *England*.

This *Insect*, saith *Moufet* (a) after others, feeds only upon Dew; and hath no Excrement; which is most unlikely. It is by some given inwardly instead of *Cantharides*, both as a safer, and more effectual *Diuretick*. And so far also a better Remedy in *Veneris languorem*. (b)

(a) Lib. de Inf.

(b) Cap. 17. p. 133.

A Great WINGED-LOCUST. Given by Sir *John Hoskins*. It seems to be the second Male described by *Moufet*. In length almost three inches. The Face perpendicular, from the Mouth to the Crown of the Head $\frac{1}{2}$ an inch. The Wings Membranous; the upper pair, the stiffest, stained with dark brown spots, and a few Rays of Red. It is one of that Swarme which some years since destroyed all the fruits in the Island of *Tenariffa*.

Of the Winged-Kind, *Moufet* reckons up about a dozen Species. Of their Generation, and the Description of the Parts thereunto subserving, see the same Author. The Description and Figure of the Lungs in *Malpighius*. (c)

(c) De Bombyce p. 28. Tab. 4.

Locusts hurt the Corn, Meadows, and Hort-Yards, not only by eating, but also by their Dung; and an ill-natur'd Spittle, much of which they spew out of their Mouths, as they eat. (d) 'Tis probable, That the Spittle (if they spew any) is not ill-natur'd; because the Jews were permitted to eat this as a clean Animal. Yet may prove hurtful to the Corn, as a Nest fit for the breeding of small Worms, or other Animals, which may disease it.

(d) *Moufet* out of *Valeriola*.

The *Ethiopians*, and divers other Nations, eat them, being first salted and dried. (e)

(e) *Muf. Wormian*.

The FEN-KRICKET or CHUR-WORME: Because towards Night, when he comes out of his Buries, he makes

makes a noise like that of a *Kricket*. So great, saith *Moufet*, as to be heard above a mile off. *Gryllotalpa*: so called by the same Author, for that with his fore-feet, which are very strong and broad, and shaped like those of a *Mole*, he continually digs up, and makes himself Buries in the Earth. His hinder Feet are very long, wherewith he leaps; and by which, as well as by his *Hood*, he borders at least, upon the *Grashopper*-Kind. His *Hood* or *Mantle*, which *Moufet* I think omits, is about $\frac{1}{2}$ an inch long; extended forward, over part of his Head; behind, over part of his Wings; before Concave, behind Convex.

His Eyes *protuberant*, yet not great (as *Moufet* would have them) but very small if compared with his Body: in colour, shape, and bigness like a *Strawberry-seed*.

His Wings, saith the same Author, are longer than his Body. Whereby it appears, that he did not take notice, That this Animal hath four Wings, whereof the uppermost pair are not above $\frac{1}{4}$ of an inch long. The other indeed are prolonged above $\frac{1}{2}$ of an inch beyond the Tail. Each of these apart is most curiously foulded up inwards with a *double Roll*, so as to end in a point; having their middle Rib (as I may call it) which covers the two Rolls, flat and edged, and divided with transverse lines at right Angles. Their being thus folded up, is a contrivance to secure them from being torn, as he runs to and fro under ground.

CHAP. II.

Of Insects with sheathed-Wings.

THE TINGLE-WORME. *Proscarabæus*. He's remarkable, especially, for his Teeth, which are two great Hooks bended inward, almost as in the *Squill-Insect*. He differs from the *Scarabæus*, chiefly, in that the *Vaginæ* or *Wing-Covers* are very short, reaching but about $\frac{1}{2}$ way toward the end of the Tail. His Wings, notwithstanding *Moufet* calls them *Alarum rudimenta*, are very perfect, and by a *treble fold* lodged under their Crustaceous Covers. He also

also omits the Description of his Eyes, which, through a *Microscope*, are a curious sight.

This *Insect*, with the least touch, drops a kind of Oily liquor from his Mouth; for which cause *Moufet* calls it *The Oil-Clock*. (a) Being bruised, it yields a fragrant smell. (b) They are numerous in *Heidleburge* and other parts of *Germany*.
(a) Cap. 23.
(b) Id. out of Toxites's Onomastichon.

The Great BULL-CHAFER, *Taurus volans maximus*. *Johnston* out of *Marggravius* in some sort describes four Species of Bull-Chafers, of which, as I take it, this is one. I meet also with the Picture of it in *Olearius*. (c) He hath three Horns. The first is only the Snout produced and bended upward, and is therefore moveable with the Head. In length, according to the figure in *Olearius* (for it is here broken off) about an inch and $\frac{1}{2}$ forked at the end; and with one upper branch a little before the Eyes. The Head very little. Upon his Shoulders he hath two immovable or unjoynted Horns, about $\frac{3}{4}$ of an inch long, $\frac{1}{4}$ of an inch over at the Base, directed forward, and with their points inward, like a *Bulls-Horns*. From the end of his Snout or fore-Horn to the end of his Tail he is about five inches long, over his Back above two and a $\frac{1}{2}$; the biggest of *Insects* yet known. His fore-Feet are armed with Spikes, as so many Claws; wherewith, 'tis likely he digs himself Buries. Of his Wings it is Observable, That at their utmost Joynt, they are laped up, or doubled inward towards the Head, and so kept safe under the Wing-Covers; being, when out at their full length, almost twice as long as the hinder Body or Section of the Animal. The like is observable of the Wings of some other *Beetles*. His Horns, Legs, Back and Wing-Covers are all black; his Belly brown.
(c) Tab. 16. Fig. 2.

Another Great BULL-CHAFER. Of the same sort.

The Lesser BULL-CHAFER. *Nasicornis Triceros minor*, so it may be called. 'Tis all over of a shining-black. Above two inches long, almost one broad. The Snout-Horn is not bended upward, as in the former; but downward, $\frac{2}{3}$ of an inch long, and edged above. On the top of his Back or fore-Section he hath two other little Horns, about $\frac{1}{2}$ of an inch long, thick as those of a *Snail*, and bended down as the former.

The HEAD and Fore-SECTION of the same Animal; but of one far bigger.

The TODDY-FLY. *Taurus volans Marggravii Quartus*, or *Nasicornis Diceros*. This here came from Guinea. 'Tis very well described by the said Author. Except, that he doth not well compare the Eyes to a *Hemp-seed*: for they are not only Sphærical, but as big as a well grown green Peas. But that shelly-Guard, which, as it were, hoops in the Eye, and hides the greater part of it, unless you lay the Insect on his Back, might occasion his mistake. He hath but two Horns, yet those great ones. A Snout-Horn bended and toothed upward, and a Shoulder-Horn bended downward. From the end of which to the end of his Tail, about five inches. But he is not so broad as the *Great Bull-Chafer*.

Thirty or forty of these together, rasping or sawing off part of the Barque of the *Toddy-Tree* by the help of their Snout-Horn, will drink themselves drunk with the liquor that flows from it: from whence their *English* Name. For which purpose, Nature hath well placed the Teeth of the said Horn, above: for that here, the Work is not done, as by a Man in sawing, by the weight of the Animal, which is inconsiderable; but by the strength of his Legs, which force the Horn upward.

See the Description of the Parts subserving to Generation in the *Philos. Transact.* N.94. Communicated by Dr. *Swammerdam*.

Two more TODDY-FLY'S, like the former.

The RHINOCEROS BEETLE. *Scarabæus Rhinoceros*. See the Figure and Description hereof in *Imperati*. It hath only one Horn upon the Nose standing almost upright, only bended a little backward, as in the *Rhinoceros*; whence its Name.

The PRICKLE-NOS'D BEETLE. *Scarabæus Naso aculeato*. I meet with it no where else. So I call it, because that in the place of the Horn above-said, it hath only a small short Prickle. The fore-Section also, near the Head, is depressed and somewhat Concave. 'Tis very near as big as the former, and of a like Chesnut-colour.

The STAG-BEETLE. *Cervus Volans*. Described by *Moufet*, *Imperati* and others. He hath his Name from his

his two Horns, which are branched like those of a Stag: but yet moveable. His Head is very big and broad; ratably, far bigger than in any other known *Beetle*, much exceeding the bigness even of the fore-Section. Under his fore-Foot, he hath *Tufts* of short brown Hair. His Wings are doubled up inward and towards the Head, as in the *Great Bull-Chafer*. From the Tips of his Horns (which are about an inch long) to the end of his Tail, above three inches in length.

His Horns being moveable, he useth them to catch hold with, as a *Lobster* doth with his Claws. For which purpose, they are not only branched inwardly, but also toothed with a numerous Series of little knobs, by which to take the furer hold.

The Description and Figure of the Lungs of this *Insect* is given by *Malpighius*. (a) Some Observations of his Nature, see in the *Philosoph. Trans. N. 127*. *Chioccus* saith, That there are many of them in *Lombardy*. (b)

(a) De Bombyce, p. 27. Tab. 3.

(b) Mus. Calceolar.

The Horns of this *Insect* being set in Gold, and so worn as an *Anulet*, are said to be of excellent force (c) in easing of Pains, and against the *Cramp*. Read *Fienus, Of the Power of Phancy*.

(c) Chioccus in Mus. Calceol.

Four more STAG-BEETLES; but lesser than the former.

Another, with the Head broken off.

The little THREE-HORNED BEETLE. *Scarabæus Triceros minor*. *Moufet* seems to describe it by the Name of Βερεπός; but imperfectly. His Head is guarded with two Shoulder-Horns, and one in the Neck between them, not in his Forehead, as *Moufet* mistakes. They are all three immoveable or unjoynted, of the thickness of a little Pin, or the bigness of short *Gooseberry* Thorns. That in the middle stands reared upward, the other two are bended a little downward. In all other parts 'tis shaped like the *Scarabæus Melanocyaneus* with furrow'd Wing-shells; of which anon.

The NOCOONACA. So called by some of the Natives of the *West-Indies*, from whence it came. I meet with it no where else. 'Tis three inches long, and an inch broad. The Head $\frac{1}{2}$ an inch broad, $\frac{1}{3}$ of an inch long. The Horns rooted on each side the top; but are all broken

off, saving a Joynt or two : which are of that thickness, as he seems to be of kin to the *Capricorne*-kind ; and may be called *The Great West-Indian GOAT-CHAFER*.

His Back-Piece near $\frac{1}{2}$ an inch long, $\frac{1}{4}$ broad, armed with two black sharp *Prickles*, $\frac{1}{2}$ of an inch long, and bended a little backwards. The Wing-shells almost square, *knobed* on each side before, where each of them hath one, and at the hinder end two more very short *Prickles*. They are cover'd with a kind of *Down*, or very short and fine Hair, like the *Pile* of Velvet ; for the most part brown, but adorned with Dashes of Red and Yellowish, or Citrine, of an answerable shape upon both shells. The brown spaces before are also rough-cast with a great number of small round black knobs, like Mourning Pins-Heads. The fore-Feet are four inches and $\frac{1}{2}$ long, as long again as the other ; contrary to what, at least, for the most part, they are in other *Beetles*. They are also set with sharp black *Prickles* like those on the Back-Piece. The rest without them. All of them vary'd with the aforesaid Colours.

Another NOCOONACA of the same bigness.

The Great *European GOAT-CHAFER*. *Capricornus maximus Europeus*. Given by Sir Philip Skippon. Described by *Moufet*. 'Tis about two inches long. Of a dark brown or Musk-colour. He hath on his Forehead two slender Horns, knoted or with many Joynts ; above an inch long, and commonly standing backward, like those of a Goat, from whence his Name.

The *Goat-Chafer*, saith *Moufet*, being weary with flying, to spare his weak Legs, wraps his Horns (*I doubt weaker than his Legs*) about the Twig of a Tree, and so rests himself.

The LONG-SHELL'D GOAT-CHAFER. *Capricornus Vaginis longioribus*. I think no where describ'd. It is above an inch long, and the Wing-shells of themselves an inch, being prolonged near $\frac{1}{4}$ of an inch beyond the *Anus* ; and near $\frac{1}{2}$ an inch broad ; so deep, as to come down below the Belly on both sides. All over of a straw-colour. The Shoulders a little knobed. The Neck, red ; and about $\frac{1}{2}$ of an inch square. The Head still lesser, scarce so big as a *Flesh-Flys*.

The MUSK-GOAT-CHAFER. *Capricornus odoratus*.
(a) Cap. 21. It is of the Middle-kind. Described by *Moufet*. (a)
While

While it lives, and for sometime after its death, It hath a fragrant smell ; from whence the Name.

The lesser *Goat-Chafer* blew and green. *Minor Chlorocyaneus*, as it may be called. About $\frac{2}{3}$ of an inch long, the Head and Neck green, the Wing-shells blew, both glossy. The Horns $\frac{1}{2}$ of an inch. The Legs like bright *Steel*.

The little *Saffron-Goat-Chafer*. *Minimus rubrocroceus*. About $\frac{1}{2}$ an inch long. His Horns $\frac{1}{2}$. His Legs like polish'd *Steel*.

The little *Brown Goat-Chafer*. *Minimus pullocroceus*, as we may call it. About $\frac{1}{2}$ inch long, and slender. Of a brown colour, with a yellow Ring on the upper part of his Neck, two more on his Wing-shells, and two sloap streakes upon each : His Horns and Legs of a *Chestnut*.

The GREAT GOGLE-EYED BEETLE. *Carabus Indiæ Orientalis maximus*. I find it no where described or pictur'd. Two inches and $\frac{1}{2}$ long, and an inch broad. His Head of a middle size. His Face perpendicular, about $\frac{1}{2}$ of an inch long, in the middle of a golden green. His Teeth like polish'd *Steel*, of great thickness and strength. His Eyes of a fine colour betwixt a light *Chestnut*, and that of red *Coral* ; of an Oval figure ; and ratably, very great, *sc.* $\frac{3}{4}$ of an inch long. Which also, so far as I have observ'd, is the principal Character of all the *Carabus*-kind, so far, as distinct from the *Capricorne* : whence I take leave for the *English* Name. His Horns rooted between the Eyes and the Snout ; but they are here broken off. His Shoulder or Back-Piece almost square ; yet edged with a Convex Margin on each side ; above $\frac{3}{4}$ of an inch broad, and $\frac{1}{2}$ an inch by the length of the *Insect* ; burnish'd with two large spots of the colour of polish'd *Bellmettle* ; betwixt which, and on the edges or margins of a shining-green.

The *Wing-shells* almost two inches long, with small furrows running by the length, and united with short transverse lines, all together, like Network. Not Oval, but rather expressing the figure of a *Speer-Mint-Leaf*. At the end of each, two very small points or prickles. In the middle, of a glorious golden red like that of burnish'd *Copper* ; On the edges of a shining blewish green. The Belly of the same colour with the middle of the *Wing-shells* ; saving, that the fore part of every Ring (whereof there
are

are three) and the Tail-piece, is also variegated with a curious sort of small white Streaks, which, at the first, look like fine Hair.

The great Joynts of the Legs (as is also best observable in other larger *Insects*) are joyn'd together, not only by Ligaments, as are the Bones in other Animals; but the globular knob of one, is entirely inclosed, and so winds, within the globular Concave of another. The imitation whereof, may be seen in the *Joynted Images*, which some *Stone-Cuters* make use of, for their direction as to *Postures*.

The THICK GOGLE-EYED BEETLE of the *East-Indies*. *Carabus Orientalis crassus*. I find it not describ'd. About an inch and $\frac{1}{2}$ long, $\frac{3}{4}$ of an inch over where thickest. His Eyes near the colour, shape and bigness of golden *Millet-seed*. His Teeth of a sad *Chestnut*, and very robust. His Horns are broken off. His Forehead, the sides of his Breast, Shoulder-piece, and Wing-shells, all rough cast, especially the two parts last nam'd; the Shoulder-piece with numerous small punches, the Wing-shells with greater and fewer; two whereof before, rounder and larger than the rest.

On his Breast he hath a short, thick and sturdy *Thorne* or *Spike* directed forward, and somewhat downward. He is all over of a curious green, bright and with strong Rays of Gold, but mostly on his Belly, Forehead, and the inward Margins of his Wing-shells. The hinder ends of which have one or two little Indentures. His Legs broken off.

The long GOGLE-EYED BEETLE of the *East-Indies*. Neither is this describ'd, that I find. About an inch and $\frac{1}{2}$ long; where broadest $\frac{1}{2}$ an inch. His Head small, somewhat bigger than that of a common *Bee*. His Eyes great, Oval, and of a *Chestnut* colour. His Forehead between them of a shining green, and rough cast. His Teeth very strong. His Horns broken off. His Shoulder-piece almost square, but somewhat broader behind. This, his Wing-shells, and his Breast of a glorious green mixed with some faint Rays of Gold; but their outer Margins, especially, as you turn him on his Belly, look of a pure *Bice-Blew*. Their hinder ends (as also the Tail) tinged with the colour

colour of bright *Copper*. Their ends are likewise indented like the leaves of some Plants; and so rounded, as both together to make an Elliptick. His Feet are lost.

The LONG STRIATED CARABUS. *Carabus sextus Aldrovandi*. Above an inch long, and $\frac{1}{2}$ broad. The Wing-shells are furrow'd by the length with small *Striæ*, and also wrought with punched or pricked lines in the same Order. The fore-feet are soled each with four little *Tufts* of Down or short Hair. Here are Three of this sort. One, all over of a blackish colour. A second hath his Shoulders and the Rimms of his Wing-shells, blew. The third hath Crimson shoulders, or like pure Lake, and the Wing-shells of a sad green with some Rays of Gold.

Another *Carabus* of the same kind with the former, but lesser, being not above $\frac{1}{2}$ or $\frac{2}{3}$ of an inch long. Here are of this *Species* of several colours. Some, of a dark-brown; others, cole-black; others, of a gilt-green; and others, of a gilt-red like bright *Copper*. None of these are punched, but only striated.

The LONG SMOOTH CARABUS. 'Tis all over of a shining-black; very smooth, without either prick'd or striated Lines. Only a row of very small Pricks just above the Rimm of the Wing-shells. Also in proportion somewhat longer and slenderer than the former.

The little GREEN CARABUS. About $\frac{1}{2}$ an inch long. His Head small, scarce so big as of the common *Black-Fly*. His Snout oblong. His Eyes gogling, and of a *Chestnut* colour. His Neck also little. His Belly and Wing-shells much broader, especially behind, which is unusual. Above, of a curious green; the Wing-shells marked with seven or eight white Specks on the Margins, and two in the middle. Underneath of a golden red.

The Little BROWN CARABUS. Like the former, saving his colours; his Snout being of a shining straw-colour; as also his Eyes, and very great; finely Cancellated; through a Glass a curious sight. His Wing-shells brown, with whitish Spots, fewer and bigger. His Legs of a golden red.

The Little BROAD CARABUS. Shorter, and proportionably broader, than any of the precedent *Species*. All over black. The Head extream small. The Shoulder-piece broad,

broad, smooth, and almost square. The Wing-shells striated, each with three ridge-lines, and each having a narrow and level Rimm or Margin; as in the other *Species*. Of this sort, here are three or four; the biggest $\frac{1}{2}$ of an inch long, and $\frac{1}{3}$ broad.

The common slender SPANISH-FLY. *Cantharis vulgaris*. It seems to border both upon the *Capricorne* and the *Carabus*.

(a) Lib. de
Insect. c. 19.

Spanish-Flys, being taken in too great a dose, will exulcerate the Bladder. Some bold *Whores* take them to kill and bring away their Conception. *Moufet* (a) speaks of a singular Remedy which he had, *Contra Veneris Languorem*. Which seems to be some Preparation of *Spanish-Flys*, by the Symptome which he saith did once follow the use of it, which was bloody Urine. Yet this hath sometimes happen'd, only *ex effrænata Venere*.

(b) Thom.
Barthol. Hist.
Cent. 5.

R *Spanish-Flys* 3i. *Rhenish-Wine*, or rather *Spirit of Wine* 3iiij. Digest them, without fire, for some days. Then filtre the *Spirit* through a brown Paper. To every spoonful of this, add seven of clean *Wine* or *Ale*. Of this mixture take the first day, one spoonful; the second, two; and so increasing every day. Against a *Virrulent Gonorrhæa*, a suppression of *Urine*, and the *Stone*, the happy success of this *Tincture*, saith *Bartholine*, (b) hath been experienced by Dr. *James-Francis Kotzbue*. I mention it, for a safe way of using this *Insect* inwardly, if in any Case we may expect more from them, than other Medicines.

The BROAD GILDED BEETLE. *Cantharis latus Moufeti*. Here are several of them. They all agree in shape; their Principal Characters, That they are broad Back'd, and Headed, like the *Scarabæus Melanocyaneus*; Tail'd, like the *Scarabæus Fullo* (of both which anon) and have a small Part indented betwixt the fore-ends of the Wing-shells, like the Tongue of a Buckle. But their Colours are various. Two of a golden green on the Back, and like burnish'd *Copper* on the Belly. One like *Bell-metal* on the Back and Belly. And one like *Copper* on the Back and Belly.

The DORR or HEDGE-CHAFER. *Scarabæus Arboreus*. Described by *Moufet*. His chief marks are these, His Head small like that of the common *Beetle*. This and his Eyes black,

black, notwithstanding *Moufet* saith these are yellow. His Shoulder-piece and the middle of his Belly also black; but just under the Wing-shells spotted with white. His Wing-shells, Legs, and the end of his Tail (which is long and flat-pointed) of a light *Chestnut*. His Breast, especially, cover'd with a downy-Hair.

The LEOPARD-FLY. *Scarabæus Fullo*. Described also by *Moufet*. 'Tis bigger than the *Dorr*. His Nose as black as jet, his Wing-sheaths, and almost all other parts, speckled with ash-colour and black: in other respects like the *Dorr*.

The little TAIL'D-BEETLE. *Scarabæus caudatus minor*. The Head and Shoulders are wanting. The Wing-shells almost two thirds of an inch long and $\frac{1}{3}$ over. Of a dull ash-colour besprinkled with extream small blackish specks. His Legs and Belly of the same. He hath a strait, pointed Tail prolonged beyond the Wing-shells $\frac{1}{2}$ of an inch, from whence I have nam'd him; and by which he seems of kin to the *Hedge-Chafer*.

The SHORT-SHELL'D BEETLE. By *Aldrovandus*, called *Scarabæus Serpentarius*, somewhat absurdly, *sc.* for that he once found them in a *Serpent*. But his Description is not ill. He seems by the shortness of his Wing-shells to border on the *Dorr* or *Hedge-Chafer*, as the former. As also by their colour, composed of black and Chestnut Rings indented together. Here are five of this *Species*.

Another of the same *Species*, with the Wing-shells all over of a Chestnut colour. Described also by *Aldrovandus*. Of this sort here are several small ones.

The BLACK and BLEW BEETLE. *Scarabæus Melanocyaneus*. See *Moufet*'s Description. Of this, the Wing-shells are striated or furrow'd by the length. All the upper parts are black, the under parts blew, exactly like that colour which *Watch-Makers* and others give to their *Steel-Works*. Sometimes the nether parts are rather reddish, just like pure bright *Copper*. Sometimes their Tails and Belly of a golden Green, of which is that called by *Wormius*, *Scarabæus χλωρόχρυσος*. Here are of these, in all, about half a score.

ANOTHER, of the same kind. But this hath both the Shoulder-piece, and also the Wing-shells very smooth.

A THIRD, a kin to the former. Yet different from them, not only in being all over black, but especially in the make of his Feet. In those, hard and sharp with several little Prickles standing in a Row, with some stragling hairs. In this, having only two sharp Hooks or Claws at the end of his Feet, and his Feet soled with a treble *Tuft* of a close short tawny Down.

The SQUARE-SHELL BEETLE. The Head and Shoulders of this are lost. The Wing-shells together, make almost a long square; being flat on the top, which is unusual, and the sides making right angles with their upper end. They are also striated or furrow'd by the length; and the sides curiously punched or pricked.

The BEETLE with pointed shells. The Head and Shoulders of this also are lost. All over of a very dark shining Bay. The Wing-shells above $\frac{1}{2}$ an inch long, and of a peculiar figure; being not only much narrower, but also pointed behind.

The LONG-HEADED BEETLE. Here are several of them; all of a dun or blackish brown. But that whereby they differ from all other *Beetles*, is the shape of the Head, which, in proportion, is very long and slender.

The small PURPLE BEETLE. Of this sort here are two somewhat flat; and one thick and round.

The BLEW ROUND BEETLE. *Viola*. One as big as a *Lady-Com*, but longer: the other near $\frac{1}{2}$ an inch long; Both of a Violet colour.

The GREEN ROUND BEETLE, burnish'd with glorious golden Rays.

The Round Chestnut BEETLE, not without some Rays of Gold.

It may be worth the trial, Whether any of the *Gilded* sort of *Beetles*, are of the same Nature with *Spanish Flies*, or may produce the same effect, with less pain.

The SPIKED WATER-CLOCK. It seems to be that which *Aldrovandus* describes (but very imperfectly) under the Name of *Scarabæus Aquaticus*. 'Tis about two inches long, and $\frac{3}{4}$ over where broadest. All over of a shining black: excepting, that his Eyes are brown; his *Antennæ*, tawny, his fore-Belly overlaid with a kind of *Lemon colour'd Velvet*. On his Back, there is a triangular piece indented between

between the Wing-shells. The Legs are much broken, on the third Joynts, at least of four of them, grow a pair of black sharp Prickles about the length and thickness of the sting of a *Bee*. But that which is most remarkable, is a strong and sharp *Spike* or *Needle* which stands horizontally on his fore-Belly, and with its point towards the Tail. His Wing-shells are carry'd down considerably below his Belly: so that being turned on his Back, he looks as if he lay in a Boat.

By the shape of the Wing-shells, this *Insect* seems, like the *Notonecta* (whereof presently) to swim on his Back. In which posture, in case of an approaching enemy, the aforesaid *Needle* is also ready for his defence.

The Great *English WATERCLOCK*. *Hydrocantharus major Anglicus*. Described (a) and figur'd (b) by *Moufet*. (a) Lib. 1. c. 23. (b) At the end of the Second Book. It comes near, in bigness, to the former; as also in shape; but hath no *Needle*, neither are the Wing-shells below the Belly. That part most observable in him, is his Eye, which is of a curious bright colour, almost like a *Butterfly*.

Another *Water-Clock* of the same *Species*.

The small brown *Water-Clock*. 'Tis flat and narrow, and $\frac{2}{3}$ of an inch long.

The smallest *Water-Clock*. Scarce bigger than a Sheep-Tick, all over of a shining black.

These *Insects* make use of their hinder Feet instead of *Oars*. They are seldom or never seen in the day, excepting in the *Water*, which they leave in the night, and fly up and down, (c)

The *BOAT-FLY*. *Notonecta*. Described by *Moufet*, (c) *Moufet*, lib. 1. c. 23. but very briefly. (d) A *Water-Insect*, in shape like that (d) Lib. 2. c. 38. which lives in *Cuccow Spittle*, but six times as big, *sc.* $\frac{2}{3}$ of an inch long. The upper Wings are opacous and thicker before; at their hinder ends, where they lap over, transparent and extream thin, like the Wing of a Fly.

He swims, saith *Moufet*, (e) contrary to other Creatures, on his (e) Lib. 2. c. 38. Back. And the shape of his Back seems to favour it, being very like the bottom of a Boat. Nor do his hinder Legs, which are thrice as long as the former, unaptly resemble a pair of *Oars*.

The Great *WINGED PUNEE*. *Cimex sylvestris alatus major*. *Moufet* (f) hath given three good Figures of this (f) Lib. 1. c. 29. Kind,

Kind, but scarce describes them. All the *Species* agree, in having a very small Head, broad Shoulders, a Pyramidal Back-piece, and the upper Wings somewhat like as in the *Boat-Fly*, *sc.* half Crustaceous and half Membranous. This, is almost $\frac{3}{4}$ of an inch long, near $\frac{1}{2}$ an inch broad. His Shoulder and Back-Pieces yellow, shining and rough cast. The fore half or crusty part of the upper Wings of a russet, the Membranous of a sad green. The Belly straw colour'd and Chesnut, and divided into several Sections with black Lines, half of them meeting at the ridge of the Belly.

The SPIKED PUNEE. In proportion longer and narrower than the former. The Back russet, brown and black. The Belly, ashen. Where, that which is most observable, is a short, flat, and very sharp *Thorne* or *Spike* standing level, as in the *Spiked Water-Clock*, but with the point the quite contrary way, *sc.* towards the Head.

The HIGH-SHOULDER'D PUNEE. He is otherwise of the shape and bigness of the former : all over of a brown or dun colour, especially the Membranous parts of his Wings.

The SQUARE-WINGED PUNEE. Scarce $\frac{1}{4}$ of an inch long, and almost as broad. Partly colour'd with a shining black, and three spots of white on each side.

Another Square PUNEE, with the Crustaceous part of the Wings russet.

The SHORT-WING'D PUNEE. In which respect chiefly, it differs from the former; the Wings being in those prolonged to the end of the Tail; here, but half way.

The LONG-PECKLED PUNEE. This kind, *Moufet* hath pictur'd among the small *Beetles*; but by a mistake, it being really a sort of *Flying Punee*, with Wings partly Crustaceous and partly Membranous, which is their Characteristick. The Shoulder-piece, Back-piece, Sides, Belly, and crusty part of the Wings, are all red bespeckled with black spots; the Membranous part, dun and speckled with white.

CHAP. III.

OF CREEPING INSECTS.

THE SMALLEST ANT or EMMET. When well grown, they are then hardly bigger than a good big Flea. In Barbados, saith Ligon, there is a larg sort of Ants, that build their Nests, with Clay and Lome, against a Wall or a Tree, as big as Bee-Hives, and divided into several Cells. (a) Of the Ingenuity of this Insect, see divers Relations in the same Author. (b) They are exceeding numerous throughout all India. So that they are forced to set the feet of their Cupboards and Chests in Cisterns of Water to preserve their Cloaths and Victuals (c) from them.

(a) Hist.
of Barb.p.64.
(b) P.63.

(c) Linchot.
p. 80.

Of their Kinds, and Generation; as also their use for feeding of Pheasants and Partridges, see some Observations in the Phil. Transf. (d) Communicated by Dr. Edmund King. Of their Nature, some others in the same Transact. (e) Communicated by Mr. Ray from Dr. Hulse and Mr. Fisher. The former observing, amongst other particulars, That the Liquor which they sometimes let fall from their Mouths, dropping upon the blew Flowers of Cichory, immediately gives them a large red stain; and supposeth, it would produce the like in other blew Flowers. The latter, That not only the Juyce, but also the Distill'd Water or Spirit of this Insect will produce the same effect, &c. Amongst which, Mr. Ray mixeth some Notes of his own.

(d) N. 23.

(e) N. 64.

The Liquor of Ants is commended by Schroder (f) for a most excellent Ophthalmick.

(f) Phar-
mac.

THE BAHAMA-SPIDER. It is of the Tarantula kind, and may be called Phalangium maximum Indicum; being the biggest of all the Species, sc. two inches long. Described by Wormius, and others. He hath six Eyes, not so big as the smallest Pins head. They stand not in a circle, as represented by Laet, Wormius, Piso, and Olearius, but two and two on each side, and two betwixt them transversely, thus :: He hath two strong black shining Teeth, like crooked Claws, standing parallel, and with their points downward,

downward, above $\frac{1}{2}$ an inch long by the bow. These
 (a) Pifo, Hist. N. l. 5. Teeth being set in Gold, are used (a) by some for *Tooth-Pickers*. Being vexed, they strike with a *Sting* so very small, as it is hardly visible. (b) They will live several Months without eating any thing.

(c) Barlæi Res Brasil. p. 224. The *Nhanduguacu*, a great Spider in *Brasile* (c) so called, is probably of the same *Species*.

The TOOTH of the NHANDUGUACU or *Bahama-Spider*.

The WEB of a *Bermuda-Spider*. It is so strong, as to
 (d) Philos. Transf. N. 40. snare a Bird as big as a *Thrush*. (d) 'Tis here wound upon a Paper like Raw-Silk.

(e) Hist. An. lib. 9. c. 39. Spiders, saith *Aristotle*, (e) cast their Threads, not from within, as an *Excrement*, as *Democritus* would have it; but from without, as the *Histrix* doth his *Quills*. Of the spinning of Spiders, and the rest of their History, see the curious Observations of Mr. *Lyster*. (f)

(f) Lib. de Araneis. The CLAW of a SCORPION. 'Tis long and slender, and belongs to the first *Species* described by *Moufet*.

A thick and short CLAW of a Scorpion, belonging to the third *Species* in *Moufet*.

The TAIL of another, with the *Sting* at the end, which is a little crooked, and as sharp as that of a *Bee*. The other parts of all three are broken off and lost.

In the *Musæum Cospiæ*: is the Figure of a very large *Scorpion*, three times as big as I find any where, yet said by *Lorenzo Legati*, to be drawn after the life.

This Insect aboundeth in *Brasile*. Those that are stung with them, suffer extraordinary pains for about twenty four hours, but seldom die upon it. (g)

(g) Joh. de Laet. l. 15. c. 6. out of Leriæ. Of *Scorpions* are prepared, *Oleum Compos. Magnum*, i. e. *Matthioli*, *Sanguineum* (h) *Magni Ducis*, & *Ol. Scorp. purgatum*. (i)

(h) Schrod. Pharm. (i) Poterius. The GREAT GALLY-WORME. *Scolopendra*. Described both by *Moufet* and *Aldrovandus*: but yet imperfectly. Neither is this here entire. Yet thus much remains Observable of the Feet; That each of them is armed, in the room of Claws, with three, four, or five Needles, of different thickness and length; some of them above $\frac{1}{4}$ of an inch long; of a black shining colour like the *Sting* of a *Bee*, and equally sharp; in respect to which the
 Figure

Figure neither of *Moufet* nor of *Aldrovandus* doth any way answer. Besides these, there are a great many more on each side, of the like shape and bigness, but of the colour of *Copper* or tarnish'd *Brass*. The Back and Sides are shag'd, the Belly smooth or bald. He is about three inches and $\frac{1}{2}$ long.

The Teeth of this Animal, are said by all to be venomous. And probably, all the Needles above described, are so likewise.

The middle Bald GALLY-WORM. *Julus glaber*. They have commonly betwixt forty and fifty Legs on a side answering to so many crustaceous Rings, with some resemblance to a *Triremis*; whence *Moufet* gives it the *English* Name.

Another Bald Gally-Worme, of a yellowish colour, and fewer Feet; being the third sort mention'd by *Moufet*.

Of the Gally-Worme Mr. *Lyster* conjectures, That it may yield an acid Spirit, like that of *Ants*. (a)

(a) Phil.
Transf. N. 68.

The SILK-WORME. *Bombyx*. The full History hereof is written by *Malpighius*; as to the manner of his feeding, the several changes he undergoes while a Worme, and while transformed into an *Aurelia*, and thence a *Butterfly*, with the business of Generation afterwards. But principally in the Anatomy of the Parts; as Feet, Mouth, Muscles, Lungs, Heart, Stomach, *Medulla Spinalis*, &c. in the Worme. And in the *Butterfly*, the Penis, *Parastata* and *Testicles* of the Male; and the Womb and *Ovarium* of the Female. Particularly, of the Lungs, he saith, That the *Silk-Worm* hath not only these, or Parts analogous, but that almost every Ring hath two pair, which are branched out to all the other Parts abovesaid: their several *Orifices* being remarkable, by so many little black Circles which encompass them, on the sides of the Worme. If any of these *Orifices* be oiled over, so as to exclude the *Aer*, the Parts to which they belong, presently grow *Paralytick*; and if all, the Worme will die within the space of a *Pater Noster*. Of the *Medulla Spinalis*, he saith to this purpose, That, from the Head to the Tail, there are about thirteen large Nodes therein; which he conceives to be, as it were, so many little Brains; the Worme having no visible Brain distinct from these Nodes.

A very

A very large *Aurelia* and Slough of a *Silk-Worm*. *Moufet* affirmeth, That in the Transmutation of the *Worm* into a *Fly*, the Head of the *Worm* makes the Tail of the *Fly*; and the Tail of the *Worm* the Head of the *Fly*. But *Sig^r. Malpighius* makes no mention hereof; neither is it any way likely to be so.

Two BAGS of the *Virginian Silk-Worm*. They are of an Ash-colour, and about the bigness of a *Pullets* Egg. Of exceeding thickness, thrice as thick as the shell of a *Hen-Egg*. It seems not to be one entire piece of Work, but composed of several Skins one within another, woven by so many *Worms*, ready for spinning, one after another. And accordingly, in each Bag, being opened, I find four *Aurelias*.

The RED or CRIMSON CATERPILLER. *Vinula*. So called, because, while living, his Body is dy'd all over with a deep *Claret* colour. See *Moufet* hereof. (a)

(a) Lib. 2.
cap. 2.

The YELLOW-CATERPILLER. *Eruca flavesceus*. Both this and the two former are all smooth or bald. This is also mention'd by *Moufet*.

The PALMER-WORM. *Ambulo*. For that he hath no certain home, or diet, but pilgrims up and down every where, feeding upon all sorts of Plants. In respect of his great shag, called also *The Bearworm*.

EARTH-EGGS. About the bigness of *Nutmegs*, and somewhat Oval. So called, because made of Earth by some sort of *Caterpillar*, or other *Insect*, for their Nests, wherein to breed under ground.

(b) L. 2. c. 37. The SQUILL-INSECT. Described by *Moufet*. (b) So called from some similitude to the *Squill-Fish*: chiefly, in having a long Body cover'd with a Crust composed of several Rings or Plates. The Head is broad and squat. He hath a pair of notable sharp Fangs before, both hooked inward like a *Bulls* Horns.

(c) Cap. 38. The WATER-SCORPION. *Moufet* (c) figures three sorts; to the third of which, this answers. He describes it not. Nor can I well, being glewed to a Paper with the Belly upward. But it may be easily known by its pointed Tail. He hath four Legs, and two Arms or Claws, betwixt which a very small Head. He's about $\frac{3}{4}$ of an inch long.

The

The SHARP-TAIL'D SEA-LOUSE. *Pediculus marinus cauda acuta*. Moufet (a) describeth an Insect by the Name (a) Lib. 38. of *Pediculus marinus*. But with a bunched, not a taper'd Tail, nor with long nodous Horns, like this. 'Tis about an inch and $\frac{1}{2}$ long, and $\frac{1}{2}$ inch broad, compos'd of several shelly Plates, like the *Asellus* or *Wood-Louse*, with as many Feet on each side.

ANOTHER, with a Tail of four Spikes or Bristles, about $\frac{1}{4}$ of an inch long, thick as a small Needle, sharp, and spread horizontally.

OSCABIORN. An Insect so called in the *Danish-Tongue*, the name signifies as much as *Ursus Voti*, or the *Lucky Bear*; Because the people commonly believe, That he who for a good while holds a certain Stone or Body contained in it under his Tongue, shall enjoy his Wish. It is usually found adhering to a kind of *Asellus* or *Cod-Fish* in the *Island-Sea*, to which it is very troublesome. This account together with the Insect it self were sent hither by Mr. *Olaus Borrichius*. Not disagreeing from *That* which is described in some sort by *Wormius*, by the same Name: nor from *That* in *Piso*, called by the *Americans*, *Acarapitamba*. Yet I find not the Figure any where to answer to the Animal; the entire length whereof, is about two inches and $\frac{1}{2}$. The fore part Oval: whence it narrows all the way to the Tail. Where broadest above $\frac{1}{4}$ of an inch. Its shelly Armor consisteth of about twenty Plates, of a straw colour: The Legs on each side in number answerable. The Eyes are most curiously latticed with cross lines, so as to divide them into an infinite number of *Rhombs*. He seemeth to have notable sharp Chisell-Teeth, whereby partly he becomes so troublesome to his Bearer. The other parts are lost.

The SEA-HORSE-LEECH. *Hirundo marina*. Described (b) De Inf. c. 7. by *Rondeletius*. (b) He hath a harder Skin, than the *Poole-Horseleech*: for which cause, he cannot draw up himself (c) Ibid. so round, but exerts and contracts his Head and Tail only. (c)

A WATER-WORME. *Lumbricus Aquaticus*. Not four inches long: but doubtless shrink up much when it died.

The HAIR-WORME. *Vermis Setarius*. Given by Mr. *Malling*. 'Tis little thicker than a Horse-Hair or a Hogs Bristle; Of a light Flesh-colour; and about $\frac{1}{4}$ of a

A a

foot

(a) N. 83.

foot in length. 'Tis commonly believed, but erroneously, that this sort of *Insect* is nothing but a Horse-Hair animated. By some, that they are bred out of *Locusts*. See *Aldrovandus* hereof. But especially the Observations of Mr. *Lyster* in the *Phil. Trans.* (a) who found them in the Belly of a kind of black and not uncommon *Beetle*; in some one only, in others two or three together: of all which he hath several Remarques.

Whether there are not a sort of Eggs first laid by some Animal upon the *Beetles* Breech, which being hatched eat their way into his Belly, may be a Question. And therefore, whether the like *Wormes*, may not sometimes be also found in the Bellies of *Locusts*.

A SEA-WORME NEST. 'Tis a piece of TUBULATED WOOD; part of the *sheathing* of a Ship. Brought in, by *Wormius*, improperly amongst Woods; as not being naturally Tubulous, but made so by a sort of *Sea-Wormes*; described by *Rondeletius*, and out of him, by *Aldrovandus* and others. The Tubular Holes are numerous, of that width as to admit a *Swans-Quill*, very round, equally wide, and winding every way too and fro, so as some times to run one into an other. Most curiously lined, or as it were Wainscoted with a white Testaceous Crust, of the same substance and thickness with those called *Tubuli Marini*.

PART II.

Of Plants.

SECT. I.

OF TREES.

CHAP. I.

Of WOODS, BRANCHES, and LEAVES.

A Piece of LIGNUM ALOË, with its own GUM growing upon it. Given by the Honorable Mr. Boyle. The tast of the Gum is perfectly like to that of the Wood. The Colour, like that of the purest and most lucid Aloe, called *Succotrina*: for with the light reflected, it looks almost like *Pitch*; with the light transmitted, it glisters like a *Carbuncle*; powder'd, it is of a reddish yellow. This, or some other like *Aromatick Gum*, the Aloe of the Hebrews: whence the other, from similitude, hath its Name.

The Tree is described by *Linschoten*; (a) about the bigness of the *Olive*. This Wood is the Heart of the Tree, the outward part, commonly called the Sap of a Tree, being whitish and soft. 'Tis said by Sir *Philiberto Vernatti*, (b) formerly Resident in *Java major*, to yield a Milk so hurtful, that if any of it lights in the Eyes, it causeth blindness; or scabbiness, if on any other part of the Body. But this, doubtless, is to be understood neither of the Heart, nor the Sap; but only of the Barque: there being no Milk-Vessels in either of the former, that I remember, in any Tree, by me observ'd.

(a) Lib. I.
c. 76.

(b) Phil.
Trans. N.43.

(a) Linsch.
l. i. c. 76.

Of this Tree there are two sorts: (a) The best, called *Calamba*, and grows most in *Malacca* and *Sumatra*. Much used in *India* for the making of *Beads* and *Crucifixes*. The wilder, called *Palo Daguilla*, and grows most in *Seylon* and *Choromandel*. With this, they burn the dead Bodies of their *Bramenes* and other men of account, in token of honor.

(b) Notæ in
Garfiam. See hereof also *Jac. Bontius*. (b)

A piece of *Indian-Wood*, called *GARON*. Very oily; in colour, hardness and weight, like to *Lignum Aloe*. But being held a little to the fire, hath a strong fragrant scent, much like to that of *Cloves*: and seems therefore, as well as by its Name, to be the Wood of the *Clove-Tree*. The *Clove-Tree* is described by *Linschoten*. (c) Shaped like a *Bay-Tree*. It grows in *Amboyna* and the Neighbour Islands. The best sort in *Makian* and *Tidor*.

(c) Lib. i.
c. 65.

The *BARQUE* of the Tree *LAWANG*. Sent from *Java major*, where it is so called. Being well chewed, it hath the self same Taste with that of *Sassafras-Barque*, so that, probably, the Tree is a *Species* of *Sassafras*.

(d) Phil.
Trans. N. 43.

Part of an Arm of the *STINKING-TREE*; as it may well be called: for it naturally smells like the strongest humane excrements, especially, as upon the emptying of a *House of Office*. It grows in the Isles of *Solon* and *Timor*, from whence Sir *Philiberto Vernatti* procur'd it and sent it to this *Musæum*. (d) Where, though it hath now been preserved many years, yet seems to give as full and quick a scent as ever. Yet in burning, it yields no smell; as do *Lignum Aloe* and some other Woods. 'Tis ponderous, hard, and of the colour of *English-Oak*; and as that, hath large *Aer-Vessels*; yet but few. I should have conjectur'd, that this Wood belong'd to the Tree called *Abovaj*, which hath a stinking smell, but that *this* is said to be the more odious when it burns.

A piece of *SERPENT-WOOD*. *Lignum Colubrinum*. There are divers sorts of Woods so call'd. This here is different from all those *Species* described by *Garfias*, and out of him by *J. Bauhinus*. Yet comes nearest to the Second. 'Tis above three inches in Diameter, the Barque thin, the Wood solid, more than that of *Pear-Tree*. Of a very bitter Taste; especially when reduced to powder.

A piece of an other sort of *SERPENT-WOOD*. Within
of

of a pale yellowish colour. Full of great *Aer-Vessels*. And also very bitter, as the former.

They grow in divers places of the *East-Indies*, as in *Seylon*, &c. And have their Name from one of their especial Uses, being an excellent Remedy (a) against the Bitings of *Vipers* and other venomous *Serpents*. They are also, saith *Bontius*, given in *India* against *Intermittent Fevers*. From whence, and their bitter Taste, one may guess, That they are either of kin to the Tree whereof the *Pulvis Patrum*; or might give occasion, to some who have been in both the *Indies*, to find out the Virtue of it. (a) Linsch. l. 1. c. 75.

The WOOD of a Tree of *Angola*, there call'd *Tacusá*. 'Tis very solid and ponderous, like that of the *Lignum vitæ*, and with a blackish grain.

Another sort of *Angola-Wood* by the Inhabitants called *CHICENGO*. 'Tis somewhat hard and ponderous, and of the colour of *Spanish-Oak*. Being power'd, it hath a bitterish Taste. Both these Woods, may be of the like use with the former.

Part of the Trunk of a young MOUNTAIN CAB-BIGE. Sent from *Jamaica* by Mr. *Sam. Moody* to the Author. Now it is dry and shrunk in, not above a foot and $\frac{1}{2}$ in compass. Consisteth of a great number of very thin fibrous Rings or Tubes one within another, now, by the shrinking up of the pithy parts, distinct.

'Tis said by Mr. *Stubs* (a) who lived for some time in *Jamaica*, where this Tree grows, That it is one sort of *Palm-Tree*. It grows also in *Barbados*: where, as it was confidently reported to the same Person, there was one about three hundred feet high, i. e. about thirty yards higher than the great ~~Sorink~~ Pillar in this City called *The Monument*. The young tender Sprouts of one year, are eaten both boyl'd and raw, and are both ways excellent good meat. (b) Phil. Transf. N. 36.

The BARQUE of a kind of *Pine-Tree* in *Nova Scotia*. Hereupon grow up and down many Knots, about the bigness of a *Horse-Bean*, hollow, and filled with a liquid, clear, and fragrant *Turpentine*; which, as it drops, the Natives gather and use as the Balsom of *Peru*.

A natural KNOT of Wood of an Oval Figure, and as big almost as a *Turkeys-Egg*: the fibers whereof are prettily

prettily waved by the transverse eruption of several small sprigs.

A supposed naturally entire RING of Wood, almost in the shape of a Womans Head-Roll, but not so big as now worn, about four or five inches Diametre. *Wormius* also mentions one in his *Musæum* like this, but somewhat bigger.

PITT-WOOD. *Lignum fossile*. Colour'd like that of the *Cedar*, but a little brighter. Smooth, light and soft; yet hath no conspicuous pores. Hath neither tast nor smell. Whence this was dig'd, is uncertain. But in *Lancashire*, and some other places here in *England*, the people find the Bodies of large Trees at a good depth underground, and which the poorer sort burn, being splinter'd, to save *Candles*.

A BRANCH of a Tree, by some called *The COCK-SPUR Tree*. Perhaps more properly, *Oxyacantha Americana*, or the *AMERICAN HAWTHORNE*. I meet with it no where described or mention'd. This Branch is an Eln long, without any appendent Branches. An inch Diametre. Of the solidity of *Hawthorne-Wood*. Encompassed with great *Thornes* alternately placed on every side, so ascending, as every two *Thornes* on the same side are about four inches and $\frac{1}{2}$ one above another. Most of them about $1\frac{1}{2}$ inch, some an inch and $\frac{1}{2}$ long, of the thickness of a large *Cocks-Spur*, and very strait. Not meerly Cortical, as the *Thornes* of *Raspis*, *Gooseberry*, and the like; but Lignous or Woody, as those of *Hawthorne*.

A BRANCH with a great WEN. It seems to be of the *Hawthorne*. The Branch, not above an inch in compass; the Knot or Wen, almost $\frac{3}{4}$ of a foot. 'Tis tuberous and spiked. So that it seems to be made by the casual eruption of several sturdy Buds together, which having begun the draught of the Sap, it still continu'd to swell the Knot, after they were faln off. And it is probable, that Animal-Wens are then produced, when two or three sprigs of a Nerve bigger or more than ordinary, shooting into a part of a Muscle, do thereby more invigorate it, and so make it capable of a more copious nourishment.

Another tuberous Knot like the former. There is one like these in the *Musæum Cospianum*. (a)

(a) Lib. 2.
c. 26.

A little

A little *Oaken* BRANCH with a great WEN growing round about it. 'Tis above a foot in compass, as big as a midling Bowl.

A WARTED-BRANCH. 'Tis of *Oak*, about as thick as ones middle Finger; the Warts the bigness of *Hasle-Nuts*.

Another BRANCH with four or five great Warts or Wens upon the sides. *Wormius*, who hath one like to these; not of *Oak*, but *Hasle*, calls it *Lignum Strumosum*.

An *Oaken* BRANCH permitted to grow for some time; after the Barque had been cut round about to the Wood. By which means, that part of the Branch above the *Cutis*, is grown much thicker, than that underneath; the one being little, more than an inch about, the other almost two inches. Neither is it only the swelth of the Barque, but the Wood it self is augmented. An Experiment lately made by Sig^r. *Malpighi*; and may seem an argument for the Circulation of the Sap. In what manner the Circulation of the Sap is performed, especially in the Root, the Author of this Catalogue hath some years since explicated. (a)

A piece of a BRANCH naturally shaped like a *Penis* with a pair of *Testicles* annexed. *Wormius* hath one like to this, which he calls *Lignum Inverecundum*. (a) In his
first Book Of
Plants, Chap;
2.

A WINGED-BRANCH of *Asb*. About two feet and $\frac{1}{2}$ long, and subdivided into two lesser. Where the division begins, the Barque is spread out from the Wood for the breadth of above an inch, and of the thickness of *Sheeps Leather*, and so joyns both the Branches together for the length of about a foot. From thence they are perfectly divided, and so wind two severall ways, almost like a *Rams Horn*; the Barque being spread out all along to their ends: yet only so as to make them edged. The two ends, with Buds like little Claws on the edges, look like a *Seals Feet*. *Wormius* hath some Branches, not of *Asb*, but *Firr*, which seem in some part answerable to this now described.

A HASLE BRANCH seeming as if it were naturally TWISTED. But made so by a *Woodbind* or some other Convolvulous Plant. In the *Mus. Cospiantum* is such another of *Hawthorne*.

A WILLOW BRANCH, winding to and agen; like a *Snake*, with six or seven close flexures. A Figure not uneasily given to a young *Twig*. A Pipe

A Pipe made of a hollow BRANCH, and twisted into a loose Knot, in which one part of the Branch is incorporated with the other.

Two large BRANCHES incorporated in the form of a *St. Andrews Cross*.

Two lesser, growing together in the same form.

Two BRANCHES growing together in the form of our Saviours Cross.

'Tis probable, That these were bound together (as may be any other) when they were young, and with the Barque pared off, where contiguous; and so, by a kind of ingrafting, became coalescent.

A PALMETO LEAF. *Palmæ humilis folium*. 'Tis a yard and $\frac{1}{2}$ long. Hath about a hundred and forty Plates, seventy on each side the middle Rib, whereupon they are all folded. Which Rib also distributes it self into Plates towards the top of the Leaf. The Plates are of several breadths from $\frac{1}{2}$ an inch to an inch and $\frac{1}{4}$. Most of them are now broken or torn asunder. But originally they make all one entire piece, rudely imitated by a folding Fan.

These are the Plates, which both the *Arabians* and *Indians* make use of to write upon, by *Impression* with a *Style*.

Part of another sort of PALM-LEAF. 'Tis $\frac{3}{4}$ of a yard long, and at one end seven inches broad: but rolled up, and with the ends of the Fibers unwoven, so as to look like a *Broom*. Of a wonderful substance, in some places $\frac{1}{2}$ of an inch thick, and very dense and stubborn work. Consisteth of great and lesser flat Fibers; and small round ones; somewhat alike as in the *Palm-Net*, whereof presently.

The Leaves of some *Palms*, are used, where they grow, for making of Garments, and thatching of Houses. The Country-People Tap the *Wine-Palm* about two feet above the ground, and of the Liquor which runs from it, and which they catch in Earthen Vessels, they make an excellent Wine called *Mignol*, like the *White Champagne*. (a) The fruitful kinds flourish chiefly in *Ægypt* and *Syria*: as also in the hottest parts of the *Indies*; and in the *Canary-Islands*: amongst which, there is one called,
The

(a) Thevetus

The Palm-Island. (a) The barren kind in *Italy* and *Sicily*. (a) J. Bauh.

The PALM-NET or BAG. The Tree which produceth it called, *Palma Saccifera*. Whether *Baughinus* giveth this under the Name of *Folium Nucis Indicæ*, is uncertain. If so, both the Figure and Description are very imperfect.

Some part of it hath been cut off both at the bottom and on the side; yet is it above two feet long; at the bottom a foot broad; from whence it tapers to the top. Originally entire, like a taper'd Bag, commonly call'd *Hippocrates's Sleeve*: but by some inconsiderate hand cut open on one side.

'Tis naturally sewed or woven together with admirable Art. And yet not with more, than that which may be observed in every Plant; though not so visibly, and with variation. There is a five-fold *Series* of *Fibers* herein. The greatest of all swell out above the rest, and like so many Ribs, are obliquely produced on both hands, so as to encompass the Sack. Along each of these woody Ribs, on the inside the Sack, runs a small whitish Line; which seems to be a Thred or Fiber of *Aer-Vessels* growing there-to. Betwixt the said large Ribs, there are others, as it were lesser, *parallally* interjected. On the inside a third *Series* also obliquely produced, and *transversly* to the former. The fourth and fifth, consist of the smallest Fibers, not only *transversly* produced, but also *alternately* from the outside to the inside of the Sack, & *vice versâ*. By which all the rest are most elaborately woven into one entire and strong piece of Work. A *Cover* which Nature hath provided, to protect the delicate Fruit of this Tree, from all the extremities of the weather, and the ravine of Birds.

Another PALM-SACK or Net, almost a yard long, and made of different Work. See one like to this in *J. Bauhinus*. (b)

About the Year 1599. the *Hollanders*, saith *Clusius*, returning from *America*, in an *Island* there, by them called *Coronopes*, found whole Woods of this Tree: and, probably, then first discover'd the same to *Europe*.

A LEAF of the ROCOUR-TREE. 'Tis near $\frac{1}{2}$ a foot long, four inches broad, the lower end Oval or Elliptick,
B b pointed

(b) L. 3.
c. 176.

pointed like a *Spear*. From the middle *Fiber*. divers other collateral ones (all prominent underneath) are produced alternately, and at acute Angles. 'Tis smooth on both sides, and of an obscure redish colour. Of this Tree (which I think grows in *New-England*) is made a sort of red powder, used for a dry colour; but being wet, at least, mixed with Oil, makes but a dull one.

CHAP. II.

Of FRUITS; particularly such as are of the Apple, Pear, and Plum-Kinds.

(a) *Hist. of Barb. p.70.*

PART of a PRICKLE-APPLE. The Tree is in some sort described by *Ligon*. (a) The Fruit is remarkable for the several Tufts or Bunches of Thorns wherewith it is armed all round about: each Bunch consisting of about six or eight Thorns; some of which stand erected, the rest couched down a little and crooked outward; of several lengths, from one inch, to above two; altogether, if pull'd off, somewhat resembling a *Jack a long-legs*.

A MALE-ORANGE of *Chio*, commonly called *Sio*.

A FEMALE-ORANGE of the same Island.

A CROWNED-ORANGE: that is, having an Orbicular Piece on the top.

(b) *Tom. I.*

A FRUIT like a little ORANGE: perhaps, *Aracynapil Paludani*; described by *J. Bauhinus*. (b) This here is crowned with a circle of $\frac{1}{2}$ an inch Diametre.

(c) *J. Bauh. Tom. I.*

A sort of BASTARD-QUINCE. *Cotoneaster Gernerii*. (c)

An HERMAPHRODITE-LIMON, exhibiting the *pudenda* of both Sexes.

(d) *Tom. I.*

A FRUIT of BRASILE, probably described in *Bauhinus* by the Name of *Bras*. (d) Of the bigness and shape of a little *Limon*. 'Tis now yellowish, when fresh, likely, of a golden colour. Filled with an innumerable company of Seeds, which *Bauh.* describes not. They are almost as hard as Stones, $\frac{1}{2}$ of an inch broad, and flat, almost as the seeds of *Lillies*.

An

An INDIAN FRUIT, having its surface (now) very uneven, with Furrows and Knobs all round about. The Furrows, ten. Both the Description and Picture hereof taken by *Baughinus* (a) from *Platerus*; But ill placed. (a) Lib. 3. cap. 204.

A Round *Indian* FRUIT with one end pointed, and a (now) granulated surface. Described as I take it by *Bauh.* (b) With the Name of *Fructus Peregrinus orbicularis cuspidatus.* (b) Lib. 3. cap. 50.

The POLVILLERIAN-PEAR: because either it grows most about *Polvilla* in *Alsatia*, or was first taken notice of there. A very small fruit, (now) no bigger than a *Nutmeg*. See *Baughinus*.

The MOUNTAIN SERVIS. *Sorbus Alpina*. Chiefly upon the *Alps*.

MYROBALANUS CHEBULA. The largest and longest of all the five Kinds known in Shops. Next to which is the *Citrine*, also long. Then the *Belliricks* and *Emblicks*, but both these are round. The *Indian* or *Black*, the smallest, and long. The Stone of the *Emblick Myrobalan*, of a peculiar angular Figure. This, and the five *Myrobalans* are all figur'd in *Besler*.

The GREAT CITRINE MYROBALAN. A rare kind. In shape like that which *Baughinus* (c) gives by the Name of *Myrobal. Rauwolfij*; but is much bigger, near two inches long, and above an inch and $\frac{1}{2}$ over. (c) Lib. 2. c. 19.

Myrobalans grow most of them in *Cambaia*, *Goa*, and *Malabar*; *Chebs*, in *Bisnagar* and *Bengala*; *Emblicks* and *Belliricks*, in *Java*; the *Great Citrine*, in *Palestine*.

These Fruits, say *Fallopins* and others who have purposely made enquiry, are no where mention'd by any of the ancient *Greeks*; but by the *Arabian* Physicians first of all. In the Countries where they grow, and may be had fresh, they are doubtless of good Medicinal use to the Natives. But as they come over hither, they are most of them meer rubbish, whereof, with the plenty of far better Medicines, we have no need. The *Chebs*, *Belliricks* and *Indians*, are Preserved with Sugar in *India*, and sent thence into all the Neighbouring Countries. The *Emblicks* are there used, as *Sumach*, &c. for the tanning of *Leather*.

SEBESTEN, i. e. *Fructus Mixæ*. It grows naturally in *Ægypt* and *Syria*: And is also nourished in *Italian* Gardens.

The JUJUBE of *Cappadocia*. *Bacca Ziziphi Cappadocica*. In shape like the wild, but lesser, and somewhat redish. Of a dryish substance, almost like that of *Hawthorne-Berries*. The Tree well described by *Dalechampius*. It grows, to the bigness of the *Willow*; especially in *Syria* and *Ethyopia*.

A Black round FRUIT of the shape and bigness of the largest *Red Cherries*. Perhaps, *Prunula Insana*.

A STONED-FRUIT in shape and bigness like a *Quince*. The Flesh or Pulp being now dry'd and shrunk, very thin. It comprehends three very great Oval Stones, thin, and brittle: in each of which is also included a *Kernel* of answerable bigness.

An ORBICULAR STONE of an *Indian-Plum*. *Os Pruni Indici fere globulare*. Of the bigness of a midling *Walnut*, of a dark bay colour, knobbed all round about, extraordinary hard, at the base and top a very little prominent.

Another GLOBULAR STONE. In shape and bigness, like the former; excepting, that the base is a very little broader. Of a citrine or straw-colour. Hard as a *Walnut*. Very uneven and rugged all round about, with small furrows and holes intermixed.

A third GLOBULAR STONE. Yet so, as to be divided into five Valves or Sides, all rugged as in the first, equally hard, and of the same bay colour. But not bigger than a midling *Cherry*.

An OVAL PLUM-SONE. As big as a *Pigeons Egg*, and of the same shape. Somewhat rough, of an Iron colour, and hard substance, but not very thick.

Another OVAL STONE. As big as a *Hens Egg*: and almost of the same figure; saving that the Base is a little blunter, the Cone or top a little smaller. Of a bay colour. Wonderful hard. Divided into five sides, rugged and uneven, with a great many holes and deep furrows. The Sides distinguished by as many strait Fissures, beginning a little above the Base, and thence prolonged towards the Cone. Within each of which also grows a stony, and as it were toothed piece above an inch long. This, the Third, and the First, are all of kin.

A LONG OVAL STONE. In length two inches, and one inch over; shaped like that of an *Olive*. Cover'd with

with a kind of straw-colour'd Membrane. Under which, 'tis all over unequal with furrows. Of a dark ash-colour without; inwardly, whitish. Exceeding hard.

Another LONG OVAL STONE. Naked or without any Membrane. Much bigger than the former, being two inches and $\frac{1}{2}$ long, and an inch and $\frac{1}{2}$ over. The furrows also of this are more, and deeper.

A THIRD of kin to the former, but far less, not much bigger than the common *Cornelian-Cherry*. These three last are all of kin. Not to be suppos'd the elder and young stones of the same fruit: for that they are all equally hard, and therefore at their full growth.

A PLUM-STONE almost like a *Walnut*. An inch and $\frac{1}{2}$ long, half an inch broad at the Base, which is a little hollowed in; in the middle an inch and $\frac{1}{2}$, the top a little sharp and prominent. It hath three sides, all uneven with many furrows, and somewhat deep. Of a straw-colour, and very hard.

A STONE figur'd into a SPHÆRICAL TRIANGLE. Near two inches long. Hard, rough, and of a *Walnut* colour. The three sides unequal: one above an inch broad, the others narrower; all united at acute angles, and a little prominent. This Stone seems to belong to the fruit which, together with the Tree, is described in *Laet* (a) by the Name of *Totocke*.

ANOTHER, of like shape, substance and colour with the former. But much less; and ratably, broader; *sc.* about an inch long, and as broad. Consisteth of three sides; whereof one the greatest, and convex; the other two almost plain or level.

A STONE ANOMALOUSLY figur'd. Above two inches long. One way, almost two, over. Another, an inch and $\frac{1}{2}$. Of a dark citrine, and somewhat rough, as it were besprinkled all over with sand. On one side, flatish, but unevenly. On the other swelling up into a double Lip, very rough; and having a Fissure running by the length.

Another ODDLY figur'd Stone. Above two inches long; In the middle, two over. At the Base, in a manner, an inch and $\frac{1}{2}$ square, $\frac{1}{2}$ an inch over at the top. Almost smooth, and of the colour of spruce *Oker*.

(a) Descr.
Ind. Occ.
l. 17. c. 4.

A THIRD. Three quarters of an inch long ; one way, $\frac{1}{2}$ of an inch over ; another, $\frac{1}{4}$. One side, Concave ; the other, Convex. The Margin pinched out into a sharpe edge. Of a dark bay.

A Great MAMMEE-STONE. Two inches and $\frac{1}{2}$ long, an inch and $\frac{1}{2}$ broad in the middle, flat, and somewhat sharp at both ends. *Baughin* gives the Description and Figure hereof both out of *Clusius*, by whom it is called *Avellana Indica*. 'Tis also curiously figur'd in *Calceolarius* : but with the same Name. And with the same, described by *Matthiolus*. All of them mistaking it for a *Nut*. Whereas in truth it is the Stone of a kind of Fruit like a great *Peach*, and bigger ; in which there are commonly two of these Stones.

A little MAMMEE-STONE. Described by *Clusius* with the mistaken Name of *Avellana Indica minor*. And, (a) Tom. I. out of him, by *Bauh.* (a)

A ROUND MAMMEE-STONE. Of the same colour with the former ; but that which is here the far greater part, of an obscure brown, and somewhat uneven with a few crooked furrows. The remainder and here the far less portion, of a shining bay. 'Tis of the bigness of a good large *Walnut*.

The Fruit grows in *Jamaica*, *Barbados*, and other parts of the *West-Indies*. Of the flesh or pulp whercof, they there make very good Conserves.

(b) Tom. I. A NETTED-STONE. Described by *Baughin* (b) with p. 328. the Title of *Fructus reticulato corio* : mistaking it for a *Nut*. The greater part of the Stone is of the same substance with that of other Plum-stones. But over this is spread a netted Work of larg woody *Fibers*. It was brought from *Guiney* ; but it grows also in *Virginia*.

Another WOODY STONE. A very great one ; but ratably short, *sc.* two inches long, and two and $\frac{1}{2}$ over, like a midling *Pippin*. Very little stony, but all its outer part, at least, perfectly woody, or made up of a multitude of woody *Fibers*. The largest whereof are prolonged from the *Base* to the *Cone*, associated all along by lesser ones running betwixt them.

A Third WOODY STONE. Almost of the shape and bigness of a *Pigeons-Egg*. But a little compressed. 'Tis cover'd

cover'd all over with Liguous *Fibers*, so extream closely woven together, that it looks as if it were all Wood. Some of the greater run directly from the Stalk to the Flower or top. So great a difference there is betwixt these *Indians* Stones, and those of our *European* Fruits, which have very few, and most not above two or three on the outside.

The STONE of the *Brasilian* Fruit called *ANDA*. *Wormius* hath given hereof but a bad Figure: but describes it better. Yet with a mistaken Title, as if it were the entire Fruit. 'Tis a very hard and great Stone, as big as a midling *Bell-Peare*, but a little compressed: broad at the Base, and sharp pointed, with some resemblance to a Heart. The sides of the Shell of a wonderful thickness. Penetrated to the Kernel with three great holes.

Amongst many observable Instances of the Contrivances Nature makes for the growth of the Seed, in whatsoever Cover (a) it be included; this Stone is one. For being so extraordinary hard and thick; it were impossible the Kernel within it (which is also great) should be supplied with *Aer* and *Sap* sufficient for its growth; were not those three great holes made on purpose, for a plentiful admission of both.

(a) See the
Authors
Book Of
Plants, c. i.
& ult.

And as great an instance it is of the seemingly wonderful force of the *Radicle*, or that small and tender part of the Kernel, which becomes the Root of the Plant; by which, chiefly, the sides of the Stone, those thick Walls, are made to cleave asunder to make way for its descent into the ground. But *Time* seems to do the same thing here, as *Celerity* doth in the *Statera*; where a small Weight set at a greater distance from the Centre of gravity, will ballance a bigger that's nearer: because, what it wants in *bigness*, is made up by the *Celerity* of its motion. So the *Radicle* of a Kernel, having though a slow motion, yet some, and that continu'd, it is able in time to master a sturdy Body which hath no contrary motion at all, but is at rest.

One or two of the Kernels, which are as big as *Damascene-Plums*, both Purge, and sometimes Vomit. If taken raw, they work roughly: but boyl'd and preserv'd with Sugar, may be given to Children. (b)

(b) Piso.

Another POYNTED-STONE. A very great one: three inches and $\frac{1}{2}$ long, an inch and $\frac{1}{2}$ over, one way; another near

near two inches. On one side, very Convex; on the opposite, almost flat. The Base Oval; the top, presently sharpen'd into a point. Of a russet colour; very hard, ruged, and having broad Furrows, most of them running by the length; out of some of which arise several woody *Fibers*.

Another like STONE. 'Tis as big as a *Pullets* Egg. On one side more Convex, as the former. Of a russet colour, hard and granulated. All over uneven with many, though not very deep Furrows, divers whereof are produced from the *Base* almost to the *Cone*.

The said Furrows, both in this and all the other Stones, are to be understood the Seats of woody *Fibers*, wherewith they were originally fill'd up.

A TWIN *Almond-Stone*.

(a) Garfias
ab. Horto.

GUM LACK, naturally adhering to a small Branch of its own Tree, called *Ber Indica*; a sort of *Plum-Tree* growing in *Pegu*, *Martaban*, and some other parts, sometimes as big as a *Wallnut-Tree*. (a) 'Tis generally agreed, That this Gum is made, in *Summer*-time, by *Winged-Ants*, out of the Tree it self. *Garfias* adds, as *Wax* is by *Bees*. How far the Comparison holds, requires examination. In the mean time, 'tis most likely, That these *Ants* finding the Sap or Gum of this Tree agreeable for their food or other use, and nibbling the *Barque* to come at it, it thereupon issues at the Wounds they make.

The *Indians* make several sorts of artificial *Lacks*, by mixing this Gum with other Materials of all colours. With these, all the turn'd Wood-Works in *India* and *China* are wrought and burnished. *Trochisci Dialacca*, a Medicine formerly much commended, but now obsolete.

CHAP. III.

Of CALIBASHES, and some other like
Fruits.

THe Great OVAL CALIBASH. In length, almost $\frac{1}{4}$ of a foot; above a foot and $\frac{1}{2}$ in compass. Its Figure answerable to that of a *Hens-Egg*, one end, *sc.* the top, being somewhat smaller than the other. 'Tis now of a kind of tawny colour, or like that of an old *Pomgranate-Pill*. About as hard as a *Walnut*, and the shell somewhat thicker. Originally fill'd (as may be seen by some of them) with a Pulp and a great number of Seeds, as is a *Melon* or *Gourd*. Yet a *Calibash* is the Fruit of a Tree. In some sort described by *Ligon*. (a)

The Middle OVAL CALIBASH. Of the same tawny colour, as the former; as also a little slenderer at the top, than the bottom. In length four inches and $\frac{1}{4}$, and 3, and $\frac{1}{2}$ broad; of the bigness of a *China Limon*. It hath a little round knob at the top, as big as a *Great Pins Head*. The Seed, almost of the colour, size and shape of an *Apple-Kernel*; saving that the top is shaped like the common Picture of a Heart. (a) *Hist. of Barb. p. 72.*

The little OVAL CALIBASH. Of a like colour with the former, but stained with some black Spots. Three inches and $\frac{1}{2}$ long; two and $\frac{1}{4}$ over; somewhat bigger than a *Turkeys-Egg*. Of a perfect Oval, that is, with both the ends cut by the same *Ellipsis*; yet both a very little prominent. And the top apiculated, as in the former. It seems a kin to the *Cucurbita Indica minor Taberna Montani*; and that the said Author mistook a *Calibash*, for a *Gourd*.

An ORBICULAR CALIBASH. Of the shape and bigness of a *Jack-Bowl*.

The halves of an ORBICULAR CALIBASH, four inches and $\frac{1}{2}$ Diametre.

The Middle (b) FLAGON CALIBASH. Figur'd after a manner by *Baughinus* with the mistaken Title of *Cucurbita Indica Lagenaria*: it being not a *Gourd*, but the Fruit of a Tree, as is above said. It hath a Head and Belly divided by a Neck, somewhat resembling an old fashion'd *Flagon*. (b) See the Great fort misplaced in Sect. 3. Ch. 2.

The Belly, about five inches and $\frac{1}{2}$ long, and four and $\frac{1}{2}$ in Diametre. The Neck, two inches long, and about an inch over. The Head, about as long, and above an inch and $\frac{1}{2}$ over. Originally, of a straw colour: but by the *Indians* painted, after a rude manner, with a dull red. The Shell very hard, and about a $\frac{1}{4}$ of an inch thick.

The little FLAGON or BOTTLE CALIBASH. About four inches and $\frac{1}{2}$ long. The Belly, three inches over. The Head, an inch and $\frac{1}{4}$. The Neck, a little above an inch. The Shell, at the top of the Head above $\frac{1}{4}$ of an inch thick.

The PEAR-CALIBASH. In length about five inches, the Neck somewhat long and slender, the Belly two inches and $\frac{1}{2}$ over: so as both in figure and bigness to resemble the *Pear* figur'd by *Bauhinus* with the Name of *Pirum Strangulatorium*. On one side, colour'd with a light, on the other with a deeper yellow.

A Double PEAR-CALIBASH.

A TRIANGULAR CALIBASH. 'Tis smooth, and black, shaped like the *Egyptian Cucumer*, called *Chate*. About five inches long. The Neck triangular; whether naturally, uncertain. From thence belly'd like a *Pear*; two inches and $\frac{1}{2}$ over. The shell very hard, and as thick as of the *Flagon-Calibash*.

These Fruits grow in *Guiney*; as also in *Virginia*, *Barbados*, and other parts of the *West-Indies*. Where they are used, either whole or cut through the middle, for *Cups*, *Dishes*, *Basons*, *Buckets*, *Flagons*, &c. according to their bigness. The Natives sometimes line their insides with some kind of *Rosin* (as we rosin Wooden-Cans) the better to preserve the Liquor they put into them; which, if spirituous, would otherwise either drench through, or loose of its strength. Whether the *Rosin* they use, be such as gives no ill tast to the Liquor may be a query.

The BAOBAB. *Abavi Clusij*. Of affinity with the Fruit by *Scaliger* called *Guanabanus*. *Wormius*, I think mistakingly, makes it the same. 'Tis well described and figur'd by *Bauhinus*. (a) This is of the bigness of a midling *Pomecitrine*, and of answerable shape. The shell of a good thickness, but not very hard; of a kind of dusky green, and faced almost all over with a velvet Down. When

(a) Lib. 1.
c. 42.

When fresh gather'd, 'tis fill'd with a soft Pulp, and as it should seem, much more juicy, than in the *Calibash*. Within the Pulp is contained a great number of Seeds, or little Stones, of the bigness, and with somewhat of the shape, of *Indian Wheat*. *Besler* hath a good Figure hereof, representing it cut open, to shew the Seeds.

The GREAT LONG BAOBAB. I meet with no Description answering to this *Species*. 'Tis in length ten inches, a foot in compass, being ratably much slenderer than the former, and almost Cylindrical. The upper end, made a little slenderer; the top of all, flat, and an inch and $\frac{1}{2}$ over.

The GREAT BELLY'D-BAOBAB. Much bigger than the former, and no where describ'd, that I find. In length, an inch above a foot; and above a foot and $\frac{1}{2}$ in compass. Towards the upper end, belly'd. But the end it self pointed almost like a *Limon*.

The *Baobab* grows in the Island *Zeilan*, and in *Ægypt*. The Juice hereof is of an acidulated Taste, very grateful: of which the *Ægyptians* make much use, especially when they travail, to quench their thirst.

The MACOCQUER. A *Virginian* Fruit, described by (a) *Bauhinus*. It seems to be of affinity with the *Calibash*, (a) *Tom. i.*
or perhaps a small *Species* thereof. It is of an Orbicular-^{254.}
Figure, and of the bigness of a little Hand-Ball. Though *Clusius* affirmeth (b) it to be sometimes four inches in (b) *Exot.*
Diameter. The shell is thin and brittle. Originally fill'd l. II. c. II.
with a soft and juicy Pulp, in which a great many Seeds of the colour and bigness of an *Apple-Kernel*.

The Natives, having empty'd the shells of the Pulp and Seeds, and in the room hereof, put in some little Stones, use them as *Rattles*, wherewith to rejoyce upon any special Occasion.

The GENIPAT, *Junipap*, or *Junipappeeywa*. A *Braſilian* Fruit so called. Described by *Bauhinus*. (c) And (c) *Tom. i.*
probably by *Piso* with the Name of *Janipaba*. This also^{253.}
is a kind of little *Calibash*. Of the bigness of a *Wallnut*, and almost Oval; containing a Pulp and Seeds much like those of the *Macocquer*. It grows upon a tall Tree.

The Natives use this Fruit against *Diarrhæas*. As also to paint themselves. They chew the Pulp, and then

squeezing the Juyce out, rub it upon their Body: as it dries, it turns to a blackish blew. This they do, when they visit a Friend, or upon any solemn Occasion, would be fine.

Another FRUIT, of kin to the former, with a pointed top. It was brought from *Guiney*.

(a) Tome I. A FRUIT resembling that described by *Bauhinus* (a) under the Name of *Chameis Acoftæ*. Yet this here, by the reduction of the point or feat of the Flower to the Base, a little flatish.

CHAP. IV.

Of NUTS, and Divers other like Fruits.

THE JACAPUCAIO-NUT. A *West-Indian* Fruit. Both this and the Tree tolerably well described by *G. Piso*.

(b) Hist. N.
Ind.

(b) It is about the bigness of a Boys Head of ten or twelve years old, somewhat oblong, with a circular Ridge toward the top. Now all over, without and within of a dark or blackish colour. The sides extraordinary warm, being an inch thick. Within, divided into four Quarters. In each of which (saith *Piso*) are contained about thirty Kernels. But here they are wanting. Described also in part, and figur'd, in *Calceolarius's Musæum*, out of *Jos. Acofta* (c) by the Name of *Amygdala dell' Anidi*.

(c) Histor.
Ind. lib. 4.

Of these Kernels, much bigger than *Almonds*, the Natives make both Medicines, and pleasant Meats. Sometimes the Fruit of one Tree, hath served to Victual a whole Camp. Those that fall are, with leave, greedily devoured by the Cattel. Of the Timber of the Tree, are made the Rowls of *Sugar-Mills*; as being tougher, or otherwise fitter for that purpose, than other Woods.

Another of the same NUTS of equal bigness.

The COVER of the said NUT. A like colour'd, and in shape almost like a *Mushroom*. When the Nut is ripe (which always hangs down) this Cover, with the least shake, falls out, and the Kernels after it, into the Laps of the Natives.

One half of the MALDIVE-NUT; called *Coccus de Maladiva*.

ladiua. Tavarcare, in the Language of the *Island*. Described by *Chioccus* (a) out of *Clusius* and *Garzias ab Horto*; and well figur'd. *Piso* (b) also hath the Description and Figure, together with a prolix Discourse hereof. They are said to be no where found, except upon the Sea-shore. Nor is the Tree it self to be seen any where in the *Island*. The entire Nut, somewhat like a double Box, or a pair of *Panniers*. This half, about a foot long, and near $\frac{1}{2}$ a foot broad; a kind of half Oval; yet flat on that side, where the two halves are conjoyn'd. The shell about $\frac{1}{4}$ th of an inch thick, and as hard as that of a *Coco-Nut*. As black as a *Coal*. This is empty; but originally they contain a certain white Pulp, of no great Taste.

(a) Musæum
Calceolar.

(b) Mautiffæ
Aromaticæ,
c. 19.

Of this Pulp both the People and Princes of *Malabar* have a high opinion, as if of great Virtue against most Diseases; especially in case of Poyson, or *Epileptick* and other like Affections. So that sometimes they value them at about five and twenty pounds a Nut. 'Tis also highly commended for the same purposes, by *Piso*, both from the experience of others, and his own. They sometimes make Drinking-Cups of the Shells, and tip them with Silver or Gold-Plate. 'Tis Death for any to be known to take up any of them; because those things that are cast upon the shore, are the Kings.

The COCO-NUT. The Fruit of a very tall Tree, both in the *East* and *West-Indies*, growing only upon the top of it. Mention'd by many Writers of Natural History, but not by any one distinctly describ'd. As by one sent me fresh by Mr. *Sam. Moody* from *Jamaica*, I had the opportunity to observe. Here are three of them entire. The biggest whereof is about a foot in length, and one and $\frac{1}{4}$ in compass. With three sides, one whereof more flat; belly'd in the middle, and somewhat Conick at both ends; so that it is a kind of Sphærical Triangle. The Husk or outmost part of the Nut on the sides, about an inch thick; at the Corners, an inch and $\frac{1}{2}$; almost wholly consisting of tough woody Fibers; so that being cut transversely, it looks like a stiff Scrubbing-Brush. Next within this Fibrous Part, lies the Shell, brown, hard, and brittle, like a *Plum-Stone*; the $\frac{1}{2}$ of an inch in thickness; about three inches Diametre, and of an Oval Figure, not much unlike that of an *Ostriches*,

Ostriches, or sometimes a *Cassowarys-Egg*. Yet so, as always to be *Trivalvours*, i. e. composed of three Sides or Plates joyned together by the length of the Shell; one Side being commonly much bigger than either of the other two. At the *Base* of the said Shell, are always likewise three conspicuous Holes, by which originally are admitted a considerable number of *Fibers* into the Concave of the Shell. Next within the Shell is a thin, dry and Membranous Coat, branched or veined all round about with a great number of *Fibers*, chiefly for the conveyance of Sap. Within this Veiny-Coat, lie's a soft, white, thick and Oval Body, commonly; but falsely, supposed to be the *Kernel*: it being only the *Cover* next or immediate thereunto. In thickness about $\frac{1}{2}$ an inch, and of a sweet and pleasant tast. This Body, while the *Nut* is yet unripe, is filled full with a very limpid and sweetish Liquor; which, in the Nut I had sent me, was in all about $\frac{1}{2}$ a pint: all conveyed from the said fibrous Coat, and filtered through this thick soft Body. Out of this Liquor, the true *Kernel* is in time produced: the Liquor diminishing, as the *Kernel* increases, in the same manner, as in an Egg, the White wafts, as the Chicken grows. Or as, indeed, in the Seeds of all Plants whatsoever, (a) which are not meerly Metaphorically, but really so many Eggs (like those of many Animals) without a Yelk.

(a) See the
Authors first
Book Of
Plants, Cap.
ult.

Letting this Liquor stand in a Bottle, corked up, for some months; although at first as clear as Rock-water, yet was it not only grown very *fetid*, but being after left open for some time, did let fall a *Sediment* above $\frac{1}{2}$ an inch thick. Arguments of its being impregnated with a sufficient store of seminal Principles.

And as no Animal Egg is vital without the Male: so neither is this Liquor, without the above-said *Fibers*; which communicate their *prolifick Vertue* to the same. Amongst which *Fibers*, being many *Aer-Vessels*, they also serve for the hardening of the Shell. As in like manner do all those that compose the outward brushy part of the *Nut*. For were the Shell not only fill'd with so great a quantity of Liquor; but also, as in many Fruits, surrounded with a juicy Pulp; betwixt both, it would remain a soft *Parenchyma* (as all vegetable Stones at first are) and never, or not soon enough, harden into a shell. For

For the more easie and convenient eruption of the *Radicle*, the Shell is not one entire piece, but divided into three (as are most Seed-Covers into two or more) distinct Plates; which gradually cleave asunder, to give way to the descent of the said *Radicle* into the ground.

Two more LONG COCO-NUTS, somewhat less than that now describ'd.

A THIRD, about as long, but much slenderer. Of the rounder kind, there is a good Figure in *Besler*; as also of the Shell.

A LONG OVAL COCO-SHELL. About $\frac{3}{4}$ a foot in length, and three inches and $\frac{1}{2}$ over. One of the three Holes at the bottom, cut wider by some Body, who had a mind to cheat the Spectator by imitating a mouth. Almost in shape and bigness like a *Cassowarys-Egg*.

Another Shell of the same shape.

THREE short Oval COCO-SHELLS.

An ORBICULAR COCO-SHELL; four inches and $\frac{1}{2}$ long, and as much in Diametre.

Another Great ORBICULAR one. 'Tis a foot and $\frac{1}{2}$ in compass. A *Coco-Nut* of a foot and $\frac{1}{4}$ compass, hath a Shell in compass about nine inches. The *Nut* therefore to which this Shell belong'd, was in compass above three quarters of a yard.

The COCO is one of the most useful Trees in the World. Of the Husk or outmost fibrous Cover of the Nut, all manner of Ropes and Cables are made throughout *India*. Of the Shells, the *Indians* make Ladles, Wine-Bottles, and many sorts of Vessels. The inmost Cover next the *Kernel*, while it contains only Liquor, they eat with salt, as a very pleasant meat. The said Liquor, is commonly used, as a clear sweet and cool Drink. Sometimes they cut away the Blossom of the young *Nut*, and binding a convenient Vessel to the place, thereby obtain a sweet and pleasant Liquor, which they call *Sura*. This standing an hour in the Sun, becomes good *Vinegar*, used throughout *India*. The same Distill'd (I suppose after fermentation) yieldeth a pretty strong *Brandy*, called *Fulo*, and is the first running. The second, is called *Uraca*, the only *Wine* of *India*. Of the same *Sura*, being boil'd, and set in the Sun, they also make a sort of brown Sugar, which they call *Jagra*.

From

From the *Kernel* it self, when fresh, and well stamped, they press out a Milk, which they always mix and eat with their *Rice-Meats*. Of the *Kernel* dry'd (called *Copra*) and stamped, they make Oil, both to eat, and to burn. Of the Leaves of the Tree (called *Olas*) they make the Sails of their Ships: as also Covers for their Houses and Tents; and Summer-Hats. Of the Wood, they make Ships without Nails; sewing the several parts together with the Cords

(a) Linscho- made of the Husk of the *Nut*. (a)

ten.

Joh. de Laet.

Piso, and

others.

A small ORBICULAR FRUIT, as it seems, of the Nut-kind, not bigger than a Physical Pill; a little flattish on that part which grows to the Husk. Very hard. And

(b) L.2.c.30.

of a shining colour, like that of red Coral. Described (b) also by *Clusius*: and neatly figur'd in *Calceolarius's* Mu-

(c) Sect. 5.

seum. (c)

ANOTHER of the same hardness, shape, and bigness; but of a shining black.

ANOTHER hard and orbicular Fruit, by *Casp. Bauhinus* called *Milium Indicum*. For what reason I see not, it having no similitude thereto. That for which it is observable, is, that it looks as if it were artificially turn'd upon a *Lath*. See a rude Figure hereof in *J. Bauhinus*.

An Oval Stone or Shell, of the bigness and shape of a midling *Olive*. Given by Mr. *Anth. Horneck*. It seems doubtful, Whether of the Plum or Nut-kind. 'Tis all over smooth, and of a shining light bay, like that of a *Mammee*. Excepting only the Base which is of a dull colour, and rugged, and having two narrow smooth *Margins* like a pair of Lips, or an open mouth: from the corners whereof runs a natural Notch round about the Stone or Shell.

The YECOTL. The Fruit of a little Tree in *New-Spain*, which the *Spaniards* call *Palmar Montensem*; and which I take to be all one with the *Palmapius*, or the *Palma Conifera*. 'Tis described and figur'd both by *J. Bauhinus*, and by *Wormius*. Who Reports out of *Laet*, That these kind of *Nuts* are always found empty, or without a *Kernel*. Which is a mistake; for this here hath one. 'Tis likely all that he saw (and so he should have said) were barren. The length of this, about two inches and half; the Diameter, one and $\frac{1}{2}$, the Figure Oval. Smooth, and of a shining

shining Bay: Composed of Scales, from the middle (where they are about $\frac{1}{2}$ an inch broad) growing lesser towards both ends, so as in some sort to resemble a *Cone*, of the *Picea Latin*: or *Male Firr-Tree*. Yet a quite different Fruit: for whereas in a *Cone*, the *Seeds* or *Kernels* are numerous, all placed between the Scales of the *Cone*; here (so far as can be guess'd by the sound) we have but one single *Kernel*, within the hollow of the Shell.

But that which is most observable, and whereof no Author takes notice either in the Description or Figure of this Fruit, is this, That the Scales which compose the Shell, are not so set together, as to have their open ends or points upwards, as in a *Cone*: but on the contrary, so as to have their roots uppermost, and their open and outmost ends or points downwards, or towards the Base of the Shell, as of the Slates upon a House towards the ground. A singular contrivance of Nature, to prevent the rain from running into the hollow of the Shell, and so rotting the *Kernel*. And although the Scales of a *Cone* are open towards the point of the *Cone*, yet even hereby they answer the same end; because it always or most commonly hangs upon the Tree with the point downward.

This Fruit is pictur'd in *Besler, Tab. 1.* But mistakenly, for the *Arecca* or *Faveel*.

The CONICK YECOTL. I find it not describ'd. 'Tis much less than the former; in length, an inch and $\frac{1}{2}$ ^d; in the middle near an inch thick. Slenderer at both ends, and the upper plainly taper'd. The Scales, as in the former.

Of the Leaves (a) of this Shrub, the *Indians* make a sort of Thread. (a) Ximenes

A SCALED FRUIT a kin to the YECOTL. 'Tis of a rounder Figure, almost like a *Pippin*, and about as big as a midling *Peach*. See the Figure hereof in *Baughin*, under the Title of *Nux Indica Tessellata*. They grow in *Guyana*.

A Great PALMACOCO-NUT. *Baughin* describes (b) another *Species* by the Name of *Fructus Palmæ Nuciferæ*. Perhaps the Tree may not be improperly call'd *Palmacocus*, as bearing a Fruit, though small, yet resembling the *Coco-*

D d

Shell.

Shell. This is the biggest of several here preserved, which make it doubtful, Whether it belong to a *Cocus* or a *Palme*. In length, near $\frac{1}{2}$ a foot; in the middle, two inches over. The *Base* somewhat Oval, and Prominent, with three large Holes, as in a *Coco*; the upper end Conick, and a little inflected. Composed of three *Valves* or *Plates*, making so many Angles, below, obscure; above, more sharp. The colour mixed, according to the distribution of the woody Fibers.

A middle PALMACOCO-NUT. As big as a larger *Walnut*. In length, an inch and $\frac{1}{2}$; the *Base*, an inch over. Figur'd into a kind of Convex *Cone*. Upon the *Margins* of the three Holes in the *Base*, are finely spread a great many small black *Fibers*; like the *Fibrillæ* of the *Lig. cili* are round about the *Crystal Humour*. See also *Clusius's* Description hereof in *Bauhinus*. Two of this *Species* are here preserved.

ANOTHER also Conick, but less. In shape like the *Pear* called *Moscatellinum*: but is scarce so big as a small *Nutmeg*. Of a woody substance, and the colour of *Box*. With three open Holes, as in all the rest.

The DOG-PALMACOCO. *Bauhinus* describes and figures one of these *Nuts* by the Name of *Nux larvata*. The like is performed in the *German Ephemerides*. But I take this to be a different *Species* from them both. In length, an inch and $\frac{1}{2}$; an inch over, where thickest; and of a Conick Figure. The Crown or thicker end of the Shell is encompassed with a great many small *Fibers*, originally spread all over the Shell, but here clip'd off by some Body, to make it look like a Head of Hair. About the middle of the Shell are two natural Holes, ratably large, like a pair of Eyes; and the upper *Margins* prominent, like Eye-brows, whereupon are naturally spread a number of small black *Fibers*, like the Hair on the Eye-brows. Underneath a third Hole, also hairy, standing in the place of a Mouth. Betwixt which, or before, there are three little Knobs, which together make no ill resemblance of a Nose, and the upper Lip all natural; So that, at the first sight, one would take it to be a little Head of a *Greyhound* carved in Wood.

TWO more, of the same kind, but much shorter.

An Oval PALMACOCO, about the bigness of a Nutmeg.

Another, of a straw colour, wrinkled, knobbed, and somewhat compressed, Figur'd in some sort by *Bauhinus*, (a) (a) Tom. I. under the Title of *Avellana Indica peculiaris Camerarij*.

A BROAD PALMACOCO. An inch over or in breadth; from the *Base* to the top directly, not above $\frac{1}{4}$. That almost flat, this with a blunt point. It hath three Holes on the sides, almost equidistant.

An ORBICULAR PALMACOCO. Yet a little compressed, as a *Bowl*. Not above $\frac{1}{2}$ an inch Diameter; of the colour and hardness of *Box*; furrow'd as a *Peach-Stone*. On the sides are three equidistant Holes, over-spread with black capillary *Fibers*.

A RHOMBOID-NUT, of affinity with the former. An inch and $\frac{1}{4}$ long; $\frac{1}{4}$ broad, and $\frac{1}{2}$ an inch thick, the sides being a little compressed. Cover'd round about with small woody *Fibers*, produced from the Stalk or Base to the top of the Shell.

The FAVEEL or FAUFEL. The Fruit of a kind of *Palme*, by the *Malabarins* called *ARECCA*. Described by *Garcias*, *Bauhinus*, and *Wormius*. But by none of them well. It hath a three-fold Cover, of so many sorts of work. The utmost, consisting of straw-colour'd, soft and (as *Garcias* rightly) downy *Fibers*. The middle, of yellowish, and sturdy ones, of the thickness of a sewing Needle: about $\frac{1}{2}$ an inch longer, than to the top of the Shell, yet couched down round about it. The inmost, a thin slender Case, but woody. Yet lined with a pithy substance. All contrived for the greater warmth, and gradual exposing of the *Nut* within to the *Aer*. This *Nut* is about the bigness of a little *Nutmeg*; but not so long.

This Fruit grows in *Malavar* and the Island *Mombaim*. Being eaten unripe, it stupifies, and as it were inebriates. For which cause, (b) some eat them to make them unsensi- (b) *Garcias*. ble of great pains. *Garcias* saith, That he used their Distill'd-Water, in *Bilious Diarrhæa's*, with great success.

A FRUIT very like to the *Faufel*. *Bauhinus* describes and figures it out of *Clusius*, by that Name. Yet it seems, to me, to be the *Faufel* it self in the Bud.

The DATE-NUT, *qu. Nucidaetylus*. I find it neither described nor figur'd by any Author. 'Tis above two inches long; near the Stalk, above an inch over; towards the top near two, being belly'd like a *Pear*. Along one side, a little ridged. The Stalk cover'd with a whitish Down, like a *Quince's*. The outward Skin of a dusky Bay, smooth, soft, and thin. Next under this is a *Work of Fibers*, not produced, as in other Fruits, by the length, but standing bolt upright, like the *Pile of Velvet*, about a $\frac{1}{4}$ of an inch in depth; or rather, like the *Bristles* upon a *Hogs* back. So that the outward Skin being taken off, the Fruit looks and feels like a round *Scrubbing-Brush*. These *Fibers* are continuous all round about with the next Cover, which is of a woody substance, and very tough, about $\frac{1}{2}$ of an inch thick. Next within this Cover or Rind, is contained a soft and light substance, which, by the space it hath left, appears to have been originally a very fleshy and sappy part. Within This lies the Stone, about as big as a young *Pigeons-Egg*. This Stone is not hollow, like others, but altogether solid, like the Stone of a *Date*, and is within of the same whitish, dense, and horny substance: from whence I have taken leave for the Name. At the top of the Stone is formed, like as in a *Nutmeg*, a little round Cell, in which the true Seed is contained, no bigger than a midling *Pins* head.

A TWIN DATE-NUT of the same *Species*.

A THIRD, a single one, with the outward Rind taken off, whereby the said bristly *Fibers* are conspicuous.

A CACAW-NUT. Given by *Francis Willughby Esq.* 'Tis five inches long; and about two, over; shaped like a *Garden-Cucumber*; but the Stalk-end a little slenderer. Now it is dry, angular with five wrinkled and black Ribs an inch broad. The spaces between, half as broad, smooth, and of a redish Bay: the blackness of the Ribs proceeding also from a fuller and deeper *Red* under the Skin; as in many other Fruits: or as *Scarlet Blood* makes blew Veins. Within the Rind are contained about fifteen or twenty *Kernels*, near as big as a *Garden-Bean*, but smaller at one end; somewhat like a little *Birds Heart*. Yet the shape, I suppose, in different *Nuts*, may have some variation.

Another CACAW-NUT, like the former; given by Mr. *John Short*. This

This Fruit grows principally in *New Spain*, and the Province of *Guatimalla* in *Mexico*. In which, and other places of the *West-Indies*, the *Kernels* are used, saith *Jos. Acosta*, (a) instead of *Money*; and commonly given to the Poor, as *Alms*. With *Chacawlate*, the *Indians* Treat Noble Men, (b) as they pass through their Country.

(a) Hist. l. 4.

c. 22.

(b) Ibid.

These *Kernels* being well pounded, as *Almonds*, in a Mortar, and mixed with a certain proportion of *Sugar* and *Spices* (according as the Trader thinks or finds it best for Sale) are commonly made up in *Cakes* or *Rowles*; which are brought over hither from *Spain*, and other parts. But those that would have a good quantity for their own private use, had much better procure the *Nuts* themselves (as fresh and new as may be) and so prepare and compound them to their own Constitution and Taste. And for those that drink it, without any Medicinal respect, at *Coffee-Houses*; there is no doubt but that of *Almonds* finely beaten, and mixed with a due proportion of *Sugar* and *Spices*, may be made as pleasant a drink, as the best *Chacawlate*.

The BUTTER-NUT: a Fruit growing in *New England*, and there so called, because the *Kernel* yieldeth a great quantity of a sweet Oil. I meet with it no where. In length, two inches and $\frac{1}{2}$; in the middle, near an inch and $\frac{1}{2}$ over; the two ends narrower, and a very little prominent, shaped somewhat like a small *Cucumber*. The Skin smoothish, and (now) brown. The substance within it, black: originally, a kind of Pulp or fleshy Rind about $\frac{1}{4}$ of an inch thick, answering to that of a *Walnut*. The Stone almost Oval, and edged with six or seven Angles by the length, the greatest, which are also opposite, ending in a sharp point. The Spaces betwixt the Angles, very uneven with a great many rugged and thin plates and knobs.

With a Decoction of the Barque of the Tree, the *English Planters* dye their *Linssey Woolsey* of a *Cinamon* colour, without *Alum*, or any thing else being added.

The EDGED-WALNUT of *New England*. In colour, as the common kind. Near an inch long, as broad, and a little above $\frac{1}{2}$ an inch thick. The Base, and especially the point, a little prominent. Figur'd with eight Angles or Edges, whereof one half sharper than the other. The *Kernel* shaped, as in the common kind.

A

A WALNUT shaped like a *Pear*. Whether monstrous, or of any *Species*, is uncertain. 'Tis two inches long, at one end $\frac{1}{4}$ of an inch thick or over, and the other, above an inch.

Another, with one Concave of the Shell twice as big as the other.

A Third, with a Shell composed of three *Valves* or *Plates*.

A NUT, which seems to be a sort of *Indian Filbert*. I find it not describ'd. Of a triangular Figure, one greater side subtended to two lesser. The *Base* $\frac{1}{2}$ an inch thick; an inch and $\frac{1}{4}$ long, or wide; from thence to the *Cone* as much. Of a brown ash-colour; and ruged all round about by the distribution of a great number of *Fibers*. Only the true *Base*, by which it joyned to the Husk, is smooth; and, as that of a *Filbert*, cleavable along the middle.

The HAZLE-NUT of *New England*. Neither is this describ'd. Here is a Box of them. They are shorter, and broader, than the common sort; the point depressed, and the *Base* more produc'd. In colour, both alike.

HAZLE-NUTS, some three, and some four growing together.

The NUT called MEHEMBETHENE. It grows upon a small Tree, like a *Hasle*, in *New Spain*. Described in *Bauhinus*. (a) 'Tis somewhat Oval, an inch and $\frac{1}{4}$ long, $\frac{2}{3}$ ds over. Divided by a triangular partition into three Cells, for the lodging of so many *Kernels*.

The BARBADO-NUT. The Fruit, in truth, of a kind of *Plum-Tree*. (b) Yet the Name prevailing, I have placed it here. Described in *Bauhinus*, *Wormius*, and others by the Name of *Avellana purgatrix Americana* s. *Ben magnum Medicorum vulgò*: (c) but not well. 'Tis about the bigness of a *Filbert*. The shell blackish, thin, and brittle, and somewhat angular. Within, there is a white soft Body, commonly, but falsely supposed to be the *Kernel*. For this Body is not divided, as are all *Kernels*, into two distinct *Lobes*, but is one entire part. Yet so as to have some little hollownes in the middle, capable to lodge a very thin *Filme*. This *Filme*, is the true *Kernel*, consisting not only of two large and perfect Leaves (answerable to the two Lobes

(a) Lib. 3.
c. 36.

(b) Lig. Hist.
of Barb. p. 67.

(c) Mus.
Wormian.

Lobes in other *Kernels*) but of those parts also, which in time become the Trunk and Root of the Tree.

These *Nuts* work strongly both by Vomit and Stool; (a) four or five of them a great Dose. Being eaten tosted, (a) Bauh. Tom. I. or injected in Clysters, (b) which is the safest way of using (b) Monardes. them, they are a present Remedy in the *Cholick*. One thing, very observable, is mention'd by Mr. Boyle; (c) and since, also by Mr. Ligon: (d) and that is, That the *Cathartick Power* of the *Nut*, although so great, yet lies only (c) In his Book of the Origine of Forms. or chiefly in that very thin *Filme* above-said, by me affirmed (d) Hist. of Barb. p. 68. to be the *Kernel*: for this being taken out, the rest may be eaten, as any other *Nut*.

A small *Indian Nut*, about an inch long, and about half an inch over; with a pretty hard Rind, and of a shining black. Excepting the colour, very like to that described and figur'd in *Bauhinus*, with the Name of *Nucula Exotica Pistacij specie*.

The *ANGOLA NUT*. About $\frac{1}{2}$ of an inch long, and as broad, on one side Convex; on the opposite, flat; and of a tawny colour. The Shell very hard. The Kernel thin and leafy, and lodged within a thick white Cover, as in the *Barbado Nut*.

They purge upward and downward: one of them will give about a dozen Stools.

The Purging-*CHESNUT*. *Castanea purgatrix*. Well described and figur'd in *Calceolarius's Musæum*. (e) The (e) Sect. 5. Figure in *Bauhinus* (who describes (f) it by the Name of (f) Tom. I. lib. 3. c. 116. *Fructus Indicus decussatus*) not so good. 'Tis a blackish Fruit, about an inch and $\frac{1}{2}$ long, almost square, and pretty flat. But that which is most observable, is the double *Sinus* which compasseth it both by the length and breadth, as if it had been girded across with a string. And, as it were, a Crescent on that side, by which it grows to the Shell.

A *FRUIT* in figure like a *Chesnut*; but 'tis much less, at least, than the common sort. The outward shell of a dusky colour, and thin, yet almost as hard as a Pebble; or like that of the Seed of *Gromwell*. Under this lies another of the usual hardness of a Fruit Stone. Within which is included a whitish Kernel, of a pleasant tast, yet producing a roughness in the Throat.

The *New England* CHESNUT. In figure, like the common sort; but a little less. The *Chesnut* was first brought from *Sardis* in *Lydia*, (a) into *Italy*, *France*, and *England*. In some places where they abound, the people make *Bread* (b) of them. Heretofore, saith *Bruyrinus*, (c) they were brought, with the last course, to the Tables of Princes. In his time, (about an hundred years since) the *French* used to make and eat *Chesnut-Pottage*.

(a) Mouf. de
Re Cib.

(b) Bauhin.

(c) Lib. de
Re Cibar.

A kind of small HORNED NUT. Not so big as a little *Nutmeg*, 'tis of a brown colour, and with two pointed knobs at one end, bended outward, like little Horns. Figur'd, as I take it, in *Baubinus* (d) by the Name of *Fructus peregrinus, exiguus orbicularis, cum Sex Nervis*.

(d) Lib. 3.
c. 104. Fig. 3.

A *Virginian* AKORN within its Cup. There is one like this described and figur'd in *Baubinus* out of *Clusius*, by the Name of *Calix cum Glante incluso maximus ex Wingandecaow*, i. e. *Virginia*. The Cup is about an inch and $\frac{1}{2}$ Diametre, and the sides very thick; composed of a great number of Scales, as the Empalement of a *Thistle*, and many other Flowers; but here very hard: of an Orbicular Figure, only open at the top about the breadth of $\frac{1}{2}$ an inch. The *Akorn* it self, little bigger than the common sort. But their tast and substance may be more grateful. For in *Virginia* they are dry'd and preserved for food. They steep, and boil them, and so eat them either with *Flesh* or *Fish*.

The ANACARDIUM. A fruit so called from some likeness it hath to a little *Heart*; but yet flattish, and near as big as a *Garden-Bean*. Described and figur'd by *Garcias*, *Baubinus*, *Wormius*, *Moscardi*, *Besler*, and others. Being held to the flame of a *Candle*, (e) it spits Fire, or sparkling flashes of divers colours. Anciently much used in Medicines, now obsolete, as *Confectio Anacardina*, &c. The Oil or Mellaginous Succus betwixt the Rind and the Kernel is that which is called (f) *Mel Anacardinum*. Either the Name of Oil (given it by most) or of *Honey*, must be improper. It is of a very Caustick and venomous Nature. Being mixed with *Lime*, 'tis used for the marking of *Cottons* (g) throughout *India*. The *Indians* pickle the green Fruit, (h) and eat them as *Olives*. When perhaps they contain little or none of that Caustick Oil.

(e) Bauhinus

(f) Mus.
Wormian.

(g) Bauh.
Tom. 1. 336.
(h) Garcias
ab Horto.

The

The ACAJU, or Cajous-AKORN. The Fruit, or rather one part of the Fruit of a Tree growing in *Brasile* (where it is called *Acajaiba*) and other *West-Indian* Countries. Chiefly described and figur'd by *Linschoten*, (a) and *Piso*. (b) The whole Fruit is called *Acaju*. That part next the Branch, by *Piso*, the *Apple*; but is shaped more like a *Pear*. To the top of which grows this part, which he calls the *Akorn*. In shape almost of an *Hares Kidney*; saving that where it grows to the *Apple* 'tis thicker, than at the other end. Of a smooth Surface, (here) mixed with ashen and brown.

Piso in describing this Fruit contradicts himself. *Flori* (saith he) *succedit Castanea, exqua crescit Pomum*. A little after, *Pomum hoc, tum Glans ei superinnascens*---. Wherein he is false to himself, but true to Nature; the *Apple* not growing upon or after the *Akorn*, as he had affirmed at first; but the *Akorn*, upon the *Apple*: as by one I have now by me, may be seen.

Wormius confoundeth the Picture of the *Acaju*, with the Description of the *Anacardium*. As may be seen by comparing *Chap.* the 22. and 24. of his *Second Book*.

The *Kernels* being pounded or ground, as *Walnuts*, yield abundance of Oil by expression. That Oil (so called) which is distinctly contained in the Shell or Rind of the *Akorn*, is of a hot biting tast, and of a kind of caustick quality. Used by the *Indians* to cure the *Itch*, *Shingles*, *Malignant Ulcers*, (c) and *St. Anthony's Fire*. (d) But the *Kernels* are accounted a great dainty, either eaten raw with Wine and a little Salt; or especially, when they are roasted, or else preserved in Sugar. For the sake of this Fruit only, (e) the Natives sometimes go to Wars; the Victors keeping possession of the Place, till they have pluck'd the Trees upon it, all clean.

By comparing what hath been said hereof, and of the *Anacardium*, together; they seem to be two *Species*, under one *Kind*.

The ANOVAI. The Fruit of a Tree, or rather the Name of the Tree it self, growing principally in *Brasile*. *Piso* distinguishes a lesser sort, from the Greater, or *Ahoaguacu*, the Tree whereon this Fruit groweth. Of a triangular Figure, almost like a little *Pouch*; about an inch

from corner to corner, very hard, smooth, of a *Chestnut* colour, and now made hollow, the *Kernel* being pick'd out; and a hole cut on the top for that purpose. Figur'd in *Baughinus*, *Piso*, and others; but more neatly in *Calceolari*'s *Musæum*.

The *Kernel*, being eaten, is a strong Poyson. The Natives of *Brasile* (a) especially when they go to Dancing, hang the empty Shells, for Ornament, and the pleasure of the Noise they make, about their Legs: as *Carriers* do Bells about their Horses Necks. The Wood (b) or Boughs being broken, stink intollerably; somewhat like to *Garlick*.

The true METHEL; or the VOMITING-NUT commonly so call'd. *Nux Vomica Officinarum*. Very well described (c) in *Baughinus*. Of the shape and bigness of a midling *Troch*, cover'd with short Hair, of a greenish brown. Very hard, and horny, and almost solid; saving that in the middle it incloses, as the *Barbado-Nut*, a thin *Filme*, which is the true seed; whereof the said horny Body, called the *Nut*, is only a great thick Cover.

This Fruit is, by *Celaspine*, most absurdly called *Fungus Orientalis*. And *Wormius* (d) speaking of it, saith, That no Body knows certainly what it is. Whereas, by Dissection, it plainly appears to be a Fruit.

I find, that *Cordus* goeth thus far, as to observe, That within this *Nut* is contained a Rudiment of the future Plant, consisting as it were of two little pretty veined Leaves, and a Stalk. But that these Leaves were the two Lobes or main Body of the Seed, that the Stalk of these Leaves, as he calls it, was the Root, and that between these Leaves was coop'd the Bud, of the future Plant, are things whereof he had not the least notion. Neither did he know (for he speaks of it as a peculiar) that the like conspicuous foliation, is, as in truth it is, observable in the seeds of a great many other Plants.

Half a Drachm of this Nut, given to a Dog, in powder, hath kill'd him, saith *Baughinus*, in four hours. About 3j, hath put a Dog into so great Convulsions, that he hath dy'd in less than half an hour.

The true VOMITING-NUT. *Nux Methel Officinarum*. So that by a mistake, the Names of the *Nut* before describ'd, and

and of this, are commonly transposed. An *East-Indian* Fruit described by *Bauhinus* (a) with the Name of *Nux* (a) *Tom. I. l. 3. c. 144.* *peregrina oculata & compressa*: from its flatness, although a little swelling on one side; and from the resemblance which the Seed-Cells, in number five, have to so many little Eyes.

Two Drachms hereof being given to a man in Powder, purgeth strongly, and especially by Vomit, but also by Stool.

CHAP. V.

Of BERRYS, CONES, LOBES, and some other Parts of Trees.

CEDRE-BERRYS. The Tree by some called *Cedrus Phœnicea*; although *Baccifera* were better, thereby to distinguish it from the *Coniferous* or great *Cedre*. Described by *Clusius* under the Name of *Oxycedrus*; from its sharp-pointed Leaves. It grows wild in *France* and *Spain*. The Berry bigger than that of the lesser *Juniper*, and of a deep *Purple*; with little knobs about it, and some resemblance of Scales.

Great JUNIPER-BERRYS. *Baccæ Juniperi majoris Clusio.* As big as *Myrtle-Berrys*, round, soft, odorous, and of a redish colour. The lesser *Juniper-Berrys* (and probably these) are of good and various use in Medicine, if they are fresh. One of the best ways of using them, is by extracting a deep and strong body'd Tincture of them with Spirit of Wine, whereof a spoonful, or more or less, to be taken in Wine or other convenient Vehicle.

The BERRYS of the MASTICH-TREE. *Baccæ Lentiscinæ.* About half as big as a midling *Peas*, round, and of a blackish colour. The Tree flourishes in *Italy*, *Spain*, and divers other places.

AROMATICK INDIAN BERRYS. *Cocculi Indi Aromatici.* There are a sort called *Cocci Orientales*, used for the taking of Fishes; but not so round as these: neither, as

I take it, are they *Aromatick*. Of these some are not much bigger than a *Black Pepper-Corn*; others, as big as a *Black Cherry*: all of them of the colour of *Cloves*. They seem to come nearest to that Fruit commonly called *Jamaican-Pepper*.

(a) Lib. 9.
c. 15. A CONE of the CEDRE of Mount *Lebanon*. *Conus Cedri magnæ s. Libani*. Given by *Abraham Hill* Esq;. Described and figur'd by *Bauhinus*. (a) Yet with the Scales represented by far too narrow or not enough expanded: in which *Besler* is more exact. 'Tis about three inches and $\frac{1}{2}$ long, and two and $\frac{1}{2}$ over; of an Oval Figure, saving that the top is flat. Of this Tree it is affirmed by *Melchior Lussy*, (b) That upon the said Mount (on which he hath seen them grow) there are some so thick, that six or seven men can hardly encompass one of them with their Arms stretched out: which may be supposed above half as thick again, as the thickest *Oak* in *England*.

(b) In suæ
Peregrinat.
Hierosolym.
cap. 13. A CONE of the MALE-FIRR. *Conus Abietis maris s. Piceæ Latinorum*. Described by *Bauhinus*. It grows abundantly in *Burgundy*, and the *Alps*; sometimes in height (c) above a hundred and thirty feet. The Cone almost Cylindrical, about eight inches long. To each Scale underneath, two winged Seeds or little Kernels are adjoyned. Curiously pictur'd by *Besler*.

A little Twin PINE-APPLE. *Pini Conus gemellus*.

Several CONES of the WILD-PINE. Of this Tree they make great store of *Pitch* in *Burgundy*.

A CYPRESS-NUT. *Strobilus Cupressinus*. By *Cæsalpine* not so properly called a Cone, because of its Figure, which is rather Orbicular. Yet any Cone is appositely called *Strobilus*, from the winding order of the Scales. 'Tis not much bigger than a large *Nutmeg*. The Tree grows abundantly in *France* and *Italy*, and there bears *Nuts*.

(d) Nomen-
clat. CAMPHIRE. The Gum of a Tree about as big as the *Hazle*; and probably of the Coniferous kind. Formerly thought a Mineral; and by *Kentman* (d) called *Bitumen Odoratum*. There are two sorts hereof. One of *China*, which is carried in Cakes and Balls, into all Places, in great abundance. The other of *Borneo*, which is far the best.

A LONG FLAT LOBE. *Lobus Buglossoides*, so I call it for its being somewhat like a *Cows Tongue*. Described

scribed by *Baùhinus* (a) with the Name of *Ceratium Mono-* (a) Lib. 12.
coccon Indicum. But this here, is thrice as big as his. 'Tis c. 3.
 ten inches long; in the middle, $4\frac{1}{2}$ over; both ends some-
 what Oval. Very flat, scarce above $\frac{1}{2}$ an inch where thick-
 est; the Belly level, the Back Convex and with a blunt
 Ridge. Of a dull russet, and all over rough with a great
 number of small Knobs. Its whole Cavity is filled up
 with one single Fruit; which *Baùhinus* not well examining,
 only calls it *Fructum ex fungosa quadam materie compactum*.
 Whereas it consisteth chiefly of a wonderful Congeries of
 white *Fibers*; not produced by the length, or breadth, but
 the thickness of the Fruit, both ways, as the Teeth in a
 double Comb. The spaces betwixt which are filled up
 with dust or powder; which was originally, the sappy *Pa-*
renchyma or Flesh of the Fruit.

Another LOBE of the same *Species*, but much less.

A THICK LOBE from *Virginea*. *Lobus ex Wingan-*
decaom. Not ill describ'd by *Clusius*. This here is not
 much above three inches and $\frac{1}{2}$ long, an inch and $\frac{1}{4}$ broad,
 and an inch thick. *Unciam densus*, saith *Clusius* improper-
 ly; that word not expressing the Dimention, but closeness
 or little porosity of a Body. There are some Lobes, saith
Laet (b) of the same *Species*, that are two or three times (b) Lib. 3.
 the bigness of This. c. 22.

A short FIBROUS LOBE. I meet with the Descripti-
 on hereof no where; nor the Figure, excepting in *Besler*, (c) (c) Tab. 1.
 by the Name of *Fructus reticulato corio*. 'Tis almost three
 inches long, an inch and $\frac{1}{4}$ broad, near an inch thick. At
 one edge it is cut through by the length; where, if you
 try to spread the sides open, it resists, from its great fibro-
 sity, like a thick sturdy piece of tann'd Leather. Lined
 within with a most smooth and thin Membrane. The Ca-
 vity all over even, or without any *Sepiment*: shewing it to
 have been fill'd up with only one large Fruit.

A Great SCALLOP'D LOBE; or rather part of it. Of
 kin to that described and figur'd in *Baùhinus* (d) by the (d) Lib. 12.
 Name of *Lobus Brasiliæ ingens Siliquæ Acaciæ formâ*. c. 8.
 The whole Lobe, is above two feet long; where broadest,
 near four inches, flat; and composed of six or seven
 Joynts, as *Baùhinus* calls them; rather Cells, so rounded
 or scallop'd on both Edges, as to look like so many
 Joynts.

Joynts. In this part of the *Lobe*, are only three. In each of them is contained a great NUT round and flat, and of a shining Bay; an inch and $\frac{1}{2}$ Diametre, and half an inch thick. In the *Lobe Bauhinus* describes they were not ripe.

A round FRUIT (probably) of a sort of SCALLOP'D LOBE. 'Tis almost of the colour, bigness, and shape of the former; saving that the sides are not so flat, but both of them a little Convex.

ANOTHER, almost of the Figure of a *Cat's Kidney*; having at the edge a shallow *Sinus* or depressure where it was fasten'd to the *Lobe*. Described in *Bauhinus* (a) by the Name of *Phaseolus Novi Orbis, Cordis figurâ*. But, as is most likely, very improperly; This being so like the Fruit of the Scallop'd *Lobe* above describ'd, which he himself makes the Fruit of a Tree; Neither doth the Kernels, its being naturally cleft into two halves, (*ut sunt omnia Phaseolacea*, as *Clusius* speaks) argue any thing. For that is not peculiar to the *Phaseolous* kind; but all other Seeds whatsoever, excepting Corn and that Kindred, are naturally cleft (b) into two or more *Lobes*. This Fruit is said to be *Cathartick*: and therefore 'tis probable, the other Species are so likewise.

(a) Lib. 17.
c.1. p. 276.

(b) See the
Authors first
Book Of
Plants, Chap.
1.

A long FRUIT of another LOBE. Described and figur'd in some sort in *Bauhinus* (c) by the Name of *Faba Americana purgatrix longior*. 'Tis two inches and $\frac{1}{2}$ long, an inch and $\frac{1}{2}$ broad, flat, the edges thick, of an Oval shape, and dusky ash-colour. Where it was fasten'd to the *Lobe*, not depressed, as in the former, but a little produc'd.

(c) Lib. 17.
p. 277.

A broad FRUIT of another LOBE. Probably described and figur'd in *Bauhinus* (d) by the Name of *Lobus Membranaceus planus niger*. If so, he should not have called it a *Lobe*, but the Fruit contained in it. 'Tis about an inch and $\frac{1}{2}$ long, and almost as broad, flat, and very thin, and of a blackish brown. One of the edges sharp, the opposite somewhat thick.

(d) Lib. 17.
p. 278.

A square FRUIT of an other LOBE. I find it no where. 'Tis almost an inch and $\frac{1}{2}$ long; at one end, an inch and $\frac{1}{2}$ broad, at the other, an inch; above $\frac{1}{2}$ an inch thick in the middle, where it swells up on both sides. Two of the edges opposite, Convex; the other two, Concave. Smooth, and of a blackish Bay. So

So many of the above-said Fruits, as are described by *Baubinus*, or other Authors, are number'd amongst Herbs, as if a sort of *Beans*. But by comparing them all together, and with the Fruit of the Scallop'd *Lobe*; they appear to have been all included in the *Lobes* of several sorts of Trees.

The COD of the wild LOCUST of *Virginia. Arbor. Lanif.*
Species. Described by (a) *Ligon*. The Cod somewhat hard and brittle. In length, $\frac{1}{2}$ a foot; sharp at both ends, in the middle an inch and $\frac{1}{2}$ over, Convex on the back, the Belly plain. Fill'd with white *Down*, not like *Cotton*, but that of the *Pappous* kind of Plants, appendent originally to the end of the Seed: but the Seeds are here wanting. (a) Hist. of Barb.

A sort of SILK COTTON with the SEEDS. Given by *Th. Povey Esq.* They seem to have been taken out of the Cod of a Tree which grows about *Bantam*; described in *Baubinus* (b) out of *Clusius*, by the Name of *Lanifera Arbor peregrina*. That this *Cotton* is not so white as that of *Clusius*, may proceed from Age, or some difference in the Tree. 'Tis rather of the colour of raw *Silk*, and hath a gloss like it; extream soft and fine, but not so long as *Cotton wooll*; and therefore unfit for Spinning. (b) Lib. 3. c. 154.

Of this *Cotton* I suppose the *Chineses* make their soft thin Paper. And it is probable, That many of our *English* Plants yield a *Down*, which would be altogether as fit for the same purpose. 'Tis also used, by the *Indians*, instead of Feathers, for the stuffing of Pillows.

SECT. II.

Of SHRUBS and ARBORESCENT Plants.

CHAP. I.

Of SHRUBS, chiefly.

THE DWARF-OAK. The Leaves shaped like those of the *Ilex*, but not prickly. It differs not in the hardness of the Wood or Boughs, from the common *Oak*; nor in the shape of the Acorns it bears; some whereof are also here preserved. Yet is it not above a yard in height. Sent hither by Mr. *Winthrop*, not long since Governour of *Connecticut*. In the Inland Parts of *New England* grow whole Forrests of this *Oak*.

The SEED of the Male HOLLY-ROSE, called *Cistus*, *mas*; and the first in number, according to *Clusius*. 'Tis included in a shelly Cover of a Pentagonal Figure; and is it self also angular, about the bigness of the Seed of *Patience*, or *Lapathum Sativum*.

The SEED of the second Male CISTUS.

The SEED of the Female CISTUS. The shell of this, not so big, nor so sharp at top, as of the Male; and both this and the Seed it self blacker. It may be, because older.

Upon the Root of the *Cistus* grows a *Parasitical* Plant, called *HYPOCISTIS*: the Juyce whereof, is commonly condensed, and so formed, like that of *Liquirish*, into Balls, and sold as a Drug.

The SEED of the CISTUS LEDON; being the first in order according to *Clusius*.

The SEED of the fourth CISTUS LEDON.

Off of the *Cistus Ledon* is gathered, the Drug called *LADANUM*: which is a kind of Gummous Exudation, chiefly found upon the Leaves. 'Tis gather'd (a) in the Dog-Days, and when the Sun shines hottest, and therefore not without intollerable labour. These Shrubs grow in
Cyprus,

(a) Hereof
see Bellonius.

Cyprus, Creet, France, Spain, &c. In *Creet*, the Principal Place for *Ladanum* is at the Foot of Mount *Ida*.

The BERRYS of the *Indian JASEMIN*, with a yellow and most fragrant Flower. The Oil of the *Ben Nut* being impregnated with the odor or spirit; especially of these yellow Flowers, and so mixed with *Pomatum*, is that which is commonly called *Jasemin Buttyr*.

The FRUIT of the *NAMBUGUACU*, a Shrub so called by the Natives of *Brasile*. Described by *Piso* and others with the Name of *Ricinus Americanus*; & *Palma Christi*. Curiously figur'd by *Tobias Aldinus*. (a) Where note, That in the said Author, through some inadvertency, the Titles of this Plant and of the *Spinacia Fragifera* are transpos'd. The Seeds are of the bigness of a *Horse-Bean*, somewhat long, smooth and glossy, ash-colour'd and mixed with black specks. The Kernel white and very oily. Given by *Dr. Wilkins* late Bishop of *Chester*, and to him, by Captain *Hinde*. (a) Deser. Horti Farnefiani.

The Oil expressed out of these Kernels, is not only used in *Lamps*, but by the Natives of *Brasile* against all cold Distempers (b) both outward and inward. Six or seven of the Kernels taken inwardly, purge and vomit with great vehemency. But a Tincture extracted out of them, is well-proposed by *Piso* (c) as the safer Medicine. Although the Kernels themselves work so strongly; yet is it affirmed by *Mr. Stubs*, (d) That the Oil which is expressed out of them, hath no Physical (*Cathartick*) Operation, although a spoonful of it be taken down at once, or three put up in a *Clyster*. The Leaves, saith the same Person, (e) are the only Remedy, which the *Indians* use for the Headach. Being steeped in Water or Vinegar, they are daily experienced to cure the *Shingles* (f) and other like Affections. (b) Piso. Hist. l. 4. c. 31.
(c) Ibid.
(d) Phil. Trans. N. 36.
(e) Ibid.
(f) Piso, ubi supra.

The FRUIT of the *URUCU*, a Shrub growing in *Brasile*. Described by *Clusius* and *Piso*. *Baughinus* ventures to call it *Bixam Oviedi*; although *Clusius* only saith it is like it. In shape and bigness, saith *Wormius*, like an *Aurange-Tree*. This Fruit is about two inches long, an inch and $\frac{1}{2}$ over; composed of two Concave *Valves*; below, Oval; above, Conich and sharp-pointed; beset all over with bristly hairs $\frac{1}{2}$ of an inch long. Within their Concaves, thirty or more little Grains, figur'd like a *Pear*, and originally of a curious bright red.

The Shrub grows wild: Yet the Natives cultivate it in Gardens with great Care and Industry. For with the scarlet Grains above said, they paint and adorn themselves. The Tincture also which they extract from them, called *Orellana*, they sell to the *Portuges*, and others which Trade with them. They likewise beat and make them up into Balls and Tablets, which they send into all parts of *Europe*. (a) The same Grains are sometimes mixed with *Chacalet*, for the grateful colour and taste which they give to it. (b) Of the Barque of the Tree, they make Ropes. (c)

(a) Pifo.

(b) Ximines.

(c) Wormius

A small Grain, in colour and shape not much unlike that above said, and probably belonging to a *Species* of the same Kind, is brought hither from the *Barbados* by the Name of *NOTTA*. Yet used by *Deyers*, made up in Cakes, for a Limon-colour. With whom, nothing is more usual, than to alter the colours of their Ingredients, by the admixture of Salts, and other ways.

(d) Honorius Bellus.

BEIDEL OSSAR, *i. e.* The Egg or Cod of the *Ossar*, a kind of *Syriac Dogs-Bane* so called; *Beid*, being the *Arabick* word (d) for an Egg. Accurately described by *Honor. Bellus*. And by *Wormius* very well figur'd. Yet *Wormius* in his Description, which he borrows of *Alpinus*, (with his Author) mistakes, in giving the Name to the Plant, which belongs only to this Egg or Cod. 'Tis soft or skinny, with some asperity. About four inches long, at the upper end sharp, and (now) hooked backward. Filled with a company of small flat Seeds, enclosed in a fine and white Down.

(e) Wormius.

(f) Hon. Bellus.

(g) Mus. Calceol.

This Shrub grows near *Alexandria*, upon a Branch or Arm of *Nilus* (e) called *Calig*. One Plant, at an Incision of the Barque, will yield no less than four pounds of Milk. A Drachm and half of this Milk, (f) will purge a Man to Death. But used outwardly, is an excellent Remedy for the Itch. (g)

(h) Lacuna.

A COD, with the Wooll and Seeds, of the COTTON SHRUB; called *Xylon Herbaceum*. Said (h) to have grown heretofore only in *Ægypt*; but now is sown, and grows abundantly in *Creet*, *Sicily*, and divers other Places in *Europe*. The Cod is trivalvovous, almost like to that of a *Tulip*, or the *Peony*. Upon the Seeds which are black Oval, and near as big as a *Horse-Bean*, hang the greatest part of the

the Wooll. They are composed chiefly of two long and thin Leaves, admirably rowled up into an Oval Figure; as I may have occasion else where to represent. They are sometimes an Ingredient in Pectoral Medicines. Some *Cotton Wooll*, though of its self, pure white; yet contrary to *Flax* and *Hemp*, looseth of its whiteness by being washed. But whether it be that of this Shrub, or that of the Cotton-Tree; or whether, according to the Climate, &c. there is not good and bad of both, I determine not.

SAVINE-BERRYS. About as big as those of the common *Juniper*, and of a blackish blew. The little Sprigs, (of which there are some here) are square; and not prickly, as those of the other *Species*. The Shrub, called *Sabina Baccifera*, and described by *Bellonius*, grows plentifully in some places in *Asia*.

The ROSE of JERICO, or CHRISTMAS-ROSE. *Rosa Hierichuntina*. Either an ignorant, or a crafty Name, agreeing neither to the place, nor nature of the Plant. For about *Jericho* 'tis no where found, (a) but in *Arabia*, upon the shore of the *Red-Sea*. A woody Shrub, but grows not above a foot or there about in height. Originally of an Aromatick smell. The Leaves of this are soft, but the Flowers remain, somewhat less than those of *Cumfrey*, and seem to consist only of two Leaves. All the Branches are closed up together, with some resemblance to the Umbel of the Plant called *Bees-Nest*, or some others of that kind.

(a) Bellonius.

Being set in Water, its several Branches will gradually be expanded. Which some Imposters knowing, choose *Christmas-Eve* for the Experiment, and so make people believe that it only opens at that time.

ANOTHER of the same less globous, or with the Branches more erect.

Part of an INDIAN PLANT, in shape like a *Wooll-Combe*; being composed of a number of strait black Teeth, very sharp, near as thick as a *Cock-Spur*, and most of them two inches long, naturally set upright, as it were, in a wooden-socket.

CHAP. II.

Of ARBORESCENT Plants.

A SPIKE of LONG PEPPER; a ſort of *Climber* or *Winder*, after the manner of *Hops*, and other like Plants. Not much differing from the Round, ſaving in the Spike. It grows in *Malabar*, *Java*, and *Sumatra*; but eſpecially in *Bengala*, where it is called *Pimpilim*. See *Piſo* hereof. (a)

(a) Mantiffæ
Aromat. c. 8.

ÆTHYOPIAN-PEPPER, or rather the Coded-Fruit hereof. Well deſcribed by *Bauhinus*. (b) By *Beſler* curiouſly figur'd. Here, upon one Stalk, hang about 15 Cods, moſt of them three inches long, thick as a *Goose-Quill*, fibrous, and of the colour of Cloves; containing ten or twelve blackiſh and longiſh Seeds, each in a Cell by it ſelf; not half ſo big as the leaſt of *French-Beans*, which *Bauhinus* affirmeth them to equal, but more like the Seed of the *Laburnum majus*. Neither, according to the ſame Author, hath it the taſt of *black Pepper*, but rather of the *Clove*; viz. not much biting, yet very *Aromatick*, eſpecially being well heated at a fire.

(b) Lib. 15.
c. 46.

POYSON-BERRYS. So they are inſcrib'd. The fruit of a Plant growing in the *Burmudas*, ſomewhat like to *Ivy*. They grow in Bunches, almoſt as thoſe of *Round Pepper*, and are much of the ſame bigneſs, almoſt of a ſtony hardneſs, yet incloſed in a thin brittle and pellucid Cover. Whether they were gather'd full ripe, appears not.

(c) Tom. I.
cap. 11.

The COD of a *West-Indian* Plant, called TAXOCO-QUAMOCHIT. This Cod, but not the Plant, is deſcribed and figur'd in *Bauhinus*. (c) 'Tis five inches long, $\frac{1}{2}$ an inch broad, and ſharp-pointed. Divided into twenty or four and twenty diſtinct Cells, made by ſo many thin Membranes, for the lodging of as many Seeds apart, of a dark Bay, and ſomewhat like thoſe of Broom.

(d) Lobus
Fabæ Braſi-
lianæ Ne-
phroidæ.

The COD of a KIDNEY-BEAN of *Bräſile*. (d) I find it not deſcribed. 'Tis Divided into two Cells, by a Partition $\frac{1}{2}$ an inch thick. Each of the Cells near two inches and $\frac{1}{2}$ long, and as broad, ſwelling out on both ſides the *Lobe*, which outwardly is very rough and tawny, hath two furrows along the

the Belly, the Back much bowed, and both of them about $\frac{1}{2}$ an inch thick.

The BEAN belonging to the ſaid COD. *Bauhinus* ſeems to deſcribe and picture (a) under the Title of *Phaſiolus peregrinus magnus, colore Caſtaneæ, cum magno hilo, lævis.* About half as big again as a *Cheſnut*, flatiſh, and having a broad, blackiſh Seat, reaching above half its compaſs. Whereby it appears to be of the *Bean-kind*, and no *Phaſiolus*; the Seat whereof, like that of the *Lupine*, is always round. Of theſe Beans, are here preſerved both black and bay. (a) Tom. 2. Cap. 17.

The COD of another *Braſilian* KIDNEY-BEAN, with the Beans enclosed. It differs from the former in being black, and in the number of its Cells, which are three. The Bean is ſomewhat Oval, and wrinkled, and having a Seat which reaches almoſt its whole compaſs. See a good Figure hereof in *Calceolarius's Muſæum*.

HERCULES'S CLUB. *Rubi facie ſenticofa Planta.* A tall woody Plant, deſcribed in ſome fort, and ſo called, by *Lobelius*. Near three yards long; how much longer, is uncertain, being cut off at both ends; almoſt ſeven inches in compaſs, ſtrait, and but very little taper'd. Originally, had two or three Branches, here cut off. Encompaſſed with a great many pointed Studs, (whence its Name) thick ſet, and ſometimes growing double, flatiſh, and about an inch broad by the length of the *Club*, after the figure of the Thorns of the *Rasberry-Buſh*. Like to which they are alſo meerly cortical, having not one fiber of wood in them, whereby they break like *Cork*, but are not ſo ſoft. The wood is as hard, as that of *Holly*, and the *Pith* but ſmall. So that notwithſtanding the ſimilitude of their Thorns, yet is it a different Plant from the *Rubus*.

The STALK of a Plant like a NET. 'Tis only the woody part of it, the Barque and Pith being both taken away. 'Tis above an Elſn long; likely, when entire, much longer, for now 'tis broken at both ends. Almoſt ſix inches about. The ſpaces between the reticulated portions of Wood, are about $\frac{1}{4}$ or $\frac{1}{2}$ of an inch over, and from two inches to four, in length. *Prince Maurice*, looking upon This as a Curioſity, upon his Return from *Braſile*, brought it thence with him. This

This being, as is likely, an Annual Plant, and therefore having a large Pith, and very open *Net-work*, is a conspicuous example of the like *Work* (though more or less open, yet) observable in the woody part of all other Plants whatsoever. (a)

(a) See the
Author's
Anatomy Of
Plants, Ch. 2.
& 3.

Several SPIKES or Heads of MAYZ or *Indian-Wheat*; with the Grains, as is not unusual, of three or four colours. The Description of the Plant, with a large Account of its Culture, and Use, were communicated by Mr. *Winthrop* sometime since Governour of *Connecticut* in *New England*: and by me lately published, in a succinct but full Relation, (b) with some alteration of the Method.

(b) Phil.
Trans. N. 142

The Plant grows to the height of six or eight feet; and is joynted like a Cane. 'Tis also full of a sweet juyce like that of the Sugar-Cane. On the Spike grow several strong thick Husks, which, before it is ripe, shut it close up round about. Thereby defending it, not only from all Weathers, but also the Ravine of Birds, to which, the Corn, while tender, is a sweet and enticing food.

The Stalks of this Corn, are good Fodder for Cattel. As are also the Husks about the Spike. The *Indian Women* slit the Husks, and weave them into Baskets of several fashions. Of the Juyce above-said may be made a Syrup as sweet as Sugar: which probably, may also be made of it, by the usual method. The *Indians* eat the ripe Corn either boil'd; or more usually parched; of it self, or, as Bread, with Flesh. The green Corn also, which, as is said, hath a sweet Taste, being boil'd, dry'd, and kept in Bags, and when they eat it, boil'd again, they account a principal Dish. The *English*, of the ripe Corn, make very good Bread: but it must be mixed nothing near so stiff as our Wheat-Meal. But the best sort of Food made hereof, they call *Samp*. Having water'd, and ground it to the bigness of Rice, and winnow'd or sifted the Hulls from it, they boil it tender, and so with Milk, or with Butyr and Sugar, make it a very pleasant Dish. 'Twas often prescribed by Dr. *Wilson* to his Patients here in *London*. The *Indians* that live much upon it, seldom troubled with the Stone. The *English* also make very good Beer, both of the Bread, and of the Malt, made of this Corn. But it will not make good Malt the ordinary way, because, not without sprouting both

both ways to a conſiderable length: whereby it is ſo matted before it is fully malted, that it cannot be opened without breaking the *Come*. To avoid which, they pare off a Turff about three inches thick, and laying the Corn all over the bare ground, cover it with the Turff, till the Plot looks like a green Field, at which time, the Corn is well malted. Then taking it up in matted pieces, they dry it on a Kiln, or in the Sun.

The SPIKE or HEAD of the *ÆGYPTIAN MAUZE*. Given by Sig^r. *Boccone* (formerly *Botanick* to the Great Duke of *Tuskany*) who brought it with him from *Sicily*, where it is frequently nurſed in *Gardens*. The *Figgs* (as *Acoſta* calls them) here grow upon it in ſeveral Bunches, nine or ten in a Bunch; two inches and $\frac{1}{2}$ long, and as thick as the middle Finger of a labouring man; being now ſhrunk up, and perhaps alſo dwarfed by the place of its growth.

This Plant, as it grows in *Ægypt* and the *Indies*, is deſcribed by *Thevetus*, with the Title above; by *Oviedus*, under the Name of *Platanus*, abſurdly received by ſome, as himſelf noteth; by *Piſo*, who, with the Natives of *Braſile*, calls it *Pacoeira*; by *Acoſta*, with the Name of *Muſa*, from the *Arabian Mous*. It grows three or four yards in height, and $\frac{3}{4}$ of a yard (a) in compaſs. Yet this Trunk, ſo great, (a) *Thevetus.* is (b) but annual. It hath Leaves above a yard and $\frac{1}{2}$ (b) *Oviedus.* long, and more than $\frac{1}{2}$ a yard broad. The *Figs* grow toward the top of the Trunk, near the ſhape and bigneſs of a midling *Cucumber*, ſometimes one or two (c) hundred of (c) *Acoſta.* them. Of a ſoft melting ſubſtance, and a ſweet and moſt delicious Taſt. In *Braſile*, either eaten by themſelves, or with their *Mandioca-Flower*; boiled, or fryed (d) with (d) *Piſo.* Butyr.

Part of a ſort of MAMBU, a great *Indian Cane*. In *Bauhinus's Pinax* called *Arundo Arbor*. Deſcribed by *Wormius*. But whereas his was black, This is of a ſtraw-colour: and much ſmaller, ſc. about ſeven inches in compaſs. Some of them grow nine or ten yards high. 'Tis hollow, quite through, excepting, that at every Joynt, 'tis cloſed up with a tranſverſe Plate or Floor. Neceſſary, for the adding ſtrength and ſturdineſs proportionable to ſo great a height.

It

(a) Wormi-
us out of
Garſias and
others.

It grows in *Malabar*, eſpecially about *Coromandel*, near the Sea-ſide. In the ſeveral hollows is found a curdled juyce, whereof the Natives make a ſort of Sugar, by the *Æthyopians* called *Tabaxyr*, much valued by the *Arabians*, becauſe of the Medicinal Virtue, (a) they at leaſt ſuppoſe it to have. In *Bantam*, the *Cane* is much uſed for the building of their Houſes.

(b) Piſo, l. 4.
c. 1.

(c) Hiſt. l. 4.
c. 1.

(d) Hiſt. of
Barb. p. 86.
&c.

The SUGAR-CANE. *Arundo Saccharina*. In *Braſile* called *Tacomaxéé*; to which place (b) it was firſt tranſplanted from the *Fortunate Iſlands*. A great *Reed* about ſeven or eight feet high, with many Joynts, one at about every $\frac{1}{2}$ foot, and a large cloſe *Pith*; out of which, the greateſt part of the Juyce, whereof the Sugar is made, is expreſſed. See the Deſcription hereof at large in *Piſo* (c) and *Ligon*; (d) together with the way of Planting, gathering and preſſing the ſame; and of ordering the expreſſed Juyce, for the making of ſeveral ſorts of *Sugar*, and *Brandy*: as alſo the Engines, and contrivance of Veſſels for the ſame purpoſes.

The principal knack, without which all their labour were in vain, is in making the Juyce, when ſufficiently boil'd, to *kerne* or *granulate*. Which is done, by adding to it, a ſmall proportion of *Lye* made with (vegetable) *Aſhes*: without which, it would never come to any thing by boiling, but a Syrup, or an Extract. But a little of that *Fixed Salt*, ſerves, it ſeems, to *Shackle* or *Crystallize* (which is a degree of *Fixation*) a very great quantity of the *Effential Salt* of this *Plant*.

(e) See Barl.
de Reb. Bra-
ſil. p. 119. &c.

In refining the Sugar, the firſt degree of pureneſs, is effected only by permitting the *Moloffes* to drain away through a hole at the bottom of the *Sugar-Pots*; the *Pots* being, all the time, open at the top. The ſecond degree is procur'd, by covering the *Pots* at the top with *Clay*. The reaſon whereof is, for that the *Aer* is hereby kept out from the *Sugar*, which, in the open *Pots*, it hardens, before it hath full time to refine by ſeparation. And therefore, whereas the firſt way requires but one Month, this requires four. The fineſt *Sugar* of all, (e) is made with *Lime-Water* (and ſometimes *Urine*) and *Whites of Eggs*. *Sugar-Candy* (*Saccharum cantum*, becauſe it ſhoots into angular Figures) by placing a great many ſlender ſticks acroſs a Veſſel of liquid *Sugar*, for it to ſhoot upon. That

That which *Dioscorides* calls *ζάχαρον*; *Galen*, *Sacchar*; & *Archigenes*, *Sal Indum*; is the same thing for substance, saith *Matthiolus*, with that we call *Sugar*: saving that, whereas this is made of the Juyce expressed and boil'd; that of the Ancients, as is likely, was only the *Tears*; which bursting out of the *Cane*, as the *Gums* or *Milks* of *Plants* are used to do, were thereupon harden'd into a pure white *Sugar*. That the *Sugar* of the Ancients was the simple Concreted Juyce of a *Cane*, He well conjectures: and what is above-said of the *Mambu*, may argue as much. But that it was the Juyce or *Tears* of the *Sugar-Cane*, he proves not. Nor, I think, could be, if, as is supposed, it was, like *Salt*, friable, and hard. And in affirming our *Sugar* to be the same for substance with that of the Ancients, he much mistakes; that being the simple Juyce of the *Cane*, this a compounded Thing, always mixed either with the *Salt of Lime*, or of *Ashes*; sometimes of *Animals* too.

The COD and SEED of the true Greater CARDAMUM, figur'd by *Besler*, in *Calceolarius's Musæum*, and others with the Name of the *Middle Cardamum*. The Plant it self, both Lesser, and Greater, described and figur'd by *Bontius*; (a) who glories himself the first that hath done it will. The Lesser grows about a yard high, with a joynted Stalk, like a *Reed*. But bears its Spikes, with the Flower and Seed, near the Root. The Greater grows two yards in height, the Stalk not joynted, with a Spike of Flowers at the top, somewhat like to that of a *Jacynth*. Both of them plentiful in *Java*. (a) Hist. 1. 6. c. 36.

The *Indians* season all their boil'd Meats herewith, preferring it before other Spices, as not being biting.

That which is commonly received amongst *Botanicks* for the Greater kind, from the fiery hot Taste of its Seeds (called *Grana Paradisi*) seems to be no *Cardamum*, but of another Tribe.

The PAPHYR-REED of *Nile*. *Papyrus Nilotica*. By the *Aegyptians* called *Berd*. Given by *Sig^r. Boccone*, who brought it out of *Sicily*, where it grew. Described and figur'd in *Bauhinus*; (b) who with *Gesner*, makes it a *Species* of *Cyperus*, to which (in Leaf and Stalk) it is like; but hath a more compacted Head. This seems to have been no tall Plant: but upon its Native Bed, *sc.* near the Banks of the River (b) Lib. 18. c. 196.

Nile, it grows above three yards high, (as high, saith *Alpinus*, above the Water) and abundantly. Which *Moses's* Mother knowing, chose well, to lay her *Babe* in *Pharaoh's* Daughter's way, yet, in the mean time, under good shelter from the scorching Sun.

Both the Barques and Leaves of some Plants, are used for writing upon by Impression. But this Plant hath its Name, not from the use either of its Leaves or Barque, but of its Pith; whereof, being beaten into a Pulp, the Pulp spread into thin Leaves, and several of those Leaves clapt together, *Papyr* fit to write upon, was formerly made, as now it is of Rags. It was also used by *Chirurgions*, as sometimes *Spong*, or *Elder-Pith* is now, for the dilating of *Fistula's*, and imbibing the sanious matter of ill-natur'd Ulcers.

Another *Head* of the same *Plant*.

SECT. III.

Of HERBS.

CHAP. I.

Of STALKS and ROOTS.

THE BULBIFEROUS GARLICK, Given by Dr. *Daniel Whistler*. So called, because in the place of Seed, it bears Bulbs at the top of the Stalk. Described by *Baubinus* (a) with the Name of *Allium proliferum*: although *Bulbiferum*, be more apposite; for that every *Plant* which bears Seed, is *proliferous*; the Seed being *Plantæ Proles*, or the *Fætus* of a *Plant*. The *Bulbs* (not fully described) are about twenty; in a round Head or Cluster as big as a *Nutmeg*; each *Bulb* equal to a middling *Peas*; consisteth of four or five shells; of which, the outmost is shrunk up to a dry Skin, on one side, of a purplish colour; the inmost incloseth that little *Particle* which in time becomes another bulbiferous Stalk, with a Root.

The

(a) Lib. 19.
c. 3.

The STRINGY BRITHWOORT. *Aristolochia Polyrhizos*. So called in diſtinction from the other kinds with tuberous Roots. Deſcribed (a) by *Bauhinus*. It grows in France and Spain; but this came from Virginia. Of all the Species the moſt Aromatick, as by taſting the Roots, although now very old, may eaſily be perceiv'd. (a) Lib. 32. c. 8.

The upright PENYROYAL. *Pulegium erectum, Virginianum*. It hath a Leaf almoſt as large as that of the *Pulegium montanum*. Yet ſmells rather like *Thyme*. Which is all the deſcription it admits, now wither'd.

A ſort of SNAKEWEED, growing near the River in Connecticut. So called, becauſe the Root is uſed for the biting of the *Rattle-Snake*. The Roots, eſpecially powder'd, are of a fragrant ſmell, and very Aromatick taſt. Yet ſeems a different Plant from the *Serpentaria* of the Shops, as having a Leaf deeply jagg'd or ſcallop'd, as that of *Ladies-Mantle*.

The ROOTS of a ſort of *Aſarum*, found about Staniford in the Weſtern parts of New England. It ſeems the ſame with the *Serpentaria* of the Shops, i. e. the *Virginian Snakeweed*. A Plant of excellent uſe in ſome Feavers.

The ROOT NINZIN, corruptly called *Genſing*. Taken from a parcel ſent over by a Chineſe Phyſitian, and given by Dr. Andrew Clench. Deſcribed (b) by *Guliel. Piſo*. Almoſt of the colour of a *Parsnep*, with ſomething of a yellowiſh hue. No bigger than a little *Skirret*; and of like conſiſtence. Not ſtringy, as that in *Piſo*, but divided, as often the *Mandrake* and ſome other Roots, into two Legs. Of a ſweetiſh Taſt, as *Piſo* ſaith rightly. But this here is alſo bitter; ſweet in the firſt or loweſt degree, and bitter in the ſecond. (b) Mantiffæ Aromat. c. 15.

This Root is not known to grow (wild) any where, but in the Kingdom of *Corea*. In which place, as alſo in *Tunquin*, *China*, and *Japan*, it is much uſed, and relied upon in *Epilepſys*, *Feavers*, and other both Chronick and Acute Diſeaſes; either alone, or in compoſition (c) as the *Baſis*. In *China*, accounted ſo great a Cordial, that one pound hereof, is there ſold for three (d) pounds (weight) of Silver. Which ſhews, That there 'tis no Native, but only a Drug. So that if the Root or Seed be deſired freſh for propagation, or other purpoſe, it were better ſought for, where it grows wild, than from thence. (c) Ibid. (d) Phil. Tranſ. N. 14. out of Thevenot's Voyages, Tom. 3.

(a) Pars 2.
c. 1.
(b) Rarior:
Pl. lib. 2.
c. 18.

The ROOT of the *Ægyptian* ARUM. Described by *Fabius Columna*, (a) with the Name of *Arum Ægyptiacum*: but called by *Alpinus*, (b) *Colocasia Strogulorbiza s. rotundâ Radice*; not rightly, as *Columna* notes. Nor do either of their Descriptions well reach it.

This here (as it is often) is a double Root; each of them round, and somewhat flat. The uppermost like the dry'd Root of *Arum*, white and friable; but the Taſt is extinct. Full and firm, in breadth or *transverſly*, two inches; encompassed with three or four very small Circles, whereupon ſeveral Leaves did once grow: underneath, are the portions of ſeveral ſmall dead Stalks; on the top and ſides, the Buds of others to come. To this, by a ſhort Neck between, hangs the lower; which being alſo the elder, is more fuzzy and ſhrunk up.

This Deſcription cannot be underſtood, without knowing that, which is very obſervable of this, and a great number of other *Plants*; and whereunto, no one *Botanick* hath adverted: *viz.* That the Root is annually repaired, or renewed out of the Stalk it ſelf. Particularly, of this *Plant*, that one of its two Roots doth every year periſh, the other is new made; not out of the other Root before it periſhes, but out of the Stalk it ſelf. The Stalk deſcending by ſuch degrees, as that part thereof which, the laſt year, was the loweſt above ground; this year, being funk (or rather by the appendent ſtrings pulled) under ground, becomes the upper Root; the next year, the under Root; and the year after, rots off; another new Root being ſtill yearly made out of the Stalk. By which way, and not as Trees by the ſame numerical Root, this and other like *Plants* are perennial.

This Root, the *Egyptians* eat very greedily, both raw, boil'd, and all manner of ways; ſuppoſing them, *prævalide excitare venerem*. The Roots of the common *Arum* boil'd, were heretofore eaten among the *Greeks*: and may taſt as well as boil'd *Onions*.

A pair of large GINGER ROOTS; one of which, when green, might weigh four or five ounces. And is ſaid to be dug up, ſometimes, of fourteen Ounces. The *Plant* uncertainly deſcrib'd. *Acoſta* compares it to that call'd *Lachryma Jobi*; *Lobelius*, (c) to a *Reed*; *Garcias*, to a *Flag*; and

(c) Lib. de
Balf.

and *Bauhinus* pictures it accordingly with a trivalvours Cod. *Piso*, out of *Bontius's* Papers, gives two Figures, one of the Male, the other of the Female: and supposeth, that the uncertainty of Relations hereof may proceed partly from the not distinguishing betwixt them. The Stalk of the Male indeed seems to have some little likeness to a *Flag*. But the Seed-Cod is there neither figur'd nor describ'd.

The best *Ginger* grows upon the Coast of *Malabar*. That which is *preserved* with *Sugar*, comes, or did at least in *Linschotus's* time, from *Bengala* and *China*.

CHAP. II.

Of FRUITS.

THE great FLAGON GOURD, or rather CALABASH, for such I take it to be, and that therefore it should have been placed with that sort of Fruit. *Bauhinus* (a) describes a *Gourd* in shape pretty like to this by the Name of *Cucurbita Lagenaria*; but mentions neither how big, nor of what hardness the shell; in which latter respect the Fruit here before us, (as do most *Calibashes*) far exceeds all the sorts of *Gourds* that I know. 'Tis very smooth, and of a parchment-colour: near eleven inches long. That part of the Neck next the Tree three inches and $\frac{1}{2}$ over; next the belly three and $\frac{1}{4}$; the belly it self, nine inches; or two feet three inches about; the top depressed. The shell as hard almost as a *Plum-stone*, and at the small end above a quarter of an inch thick.

A LONG *Indian* GOURD. I find it not describ'd. Almost of a golden colour; in length, ten inches; in the middle, where it is thickest, three over; from thence it grows slender to the Stalk; the top Oval. Made angular with ten Ribs, or great Fibers produced by the length, in the middle about an inch distant one from another, and appearing the higher, by the shrinking down of the sides between them. The Rind not hard, within, whitish and very fibrous. The Seeds, black and rough, near $\frac{1}{2}$ an inch long,

(a) Lib. 16.
c. 1.

long, flat, oval, and horned, as it were, with two knobs at the Base: being chewd, of a very bitter tast.

The WARTED GOURD. Figur'd, and in some sort
(a) Lib. 16. described (a) in *Bauhinus*. Probably, *Lobelius's Sicyopepon*
c. 1. *Strumosus*. This is above a foot and $\frac{1}{2}$ about, near $\frac{1}{2}$ a foot
long, thickest towards the top, and there a little depressed
as an *Apple*. Soft and brittle, and now just of the colour
of *Buff-Leather*. The Warts or Knobs all round about it,
are neither blisters, nor solid, but embossed parts of the
Rind.

Another of the same *Species*, but lesser.

The LONG WARTED GOURD. Not described.
Almost two feet in compass, and near a foot in length.
In other respects, altogether like the former.

ANOTHER with small and few WARTS. About four
inches long, towards the upper end, as much over. The
colour, and shape at the top, as of the rest.

The BROAD TUBEROUS GOURD. Probably that
(b) Lib. 16. described and figur'd in *Bauh.* (b) by the Name of *Cu-*
c. 1. *curbita Clypeiformis* s. *Melopepon latus*; at least of kin to it.
Of a Buff colour, as the former; four inches long, four
and $\frac{1}{2}$ broad; surrounded with undulated Knobs an inch
or $1\frac{1}{2}$ over, with furrows between each Knob and by the
length; depressed at the bottom; the top with a knob $\frac{1}{2}$ an
inch over.

The FLAT GOURD. *Melopepo compressus alter, Lo-*
belio. This came from *Virginia*. 'Tis three inches long,
or from the Stalk to the top, and three and $\frac{1}{2}$ inch broad;
at both ends, compressed like a Bowl. Of a dusky yellow
mixed with tawny.

The Little, Round, Bitter GOURD. Figur'd in *Bau-*
(c) Lib. 16. *hinus* (c) under the Title of *Cucurbita amara, fructu parvo,*
c. 1. *globofo, colore varia*. The Description lies in the Name. A
sort of *Colocynthis*.

The Yellow, Round, GOURD. In *Bauh.* the Fruit and
Plant together, entitul'd, *Cucurbita aspera, minima, sphæ-*
rica, crocea, variegata. With a conjecture of its being the
same with that which by *Tabernamontanus* is called *Pepo In-*
dica minor.

Not only the shells of *Calabashes*, but also the Rinds of
Gourds, are used as Vessels for *Gums*, and other matters
better

better than Earth or Wood, as being both light, and not brittle. The little bitter *Gourd*, being eaten, worketh by Vomit and Stool. The Water distill'd from unripe *Gourds*, applied with Linnen, is most successful, and a great Experiment against that Heat, called *Syriasis*, (a) especially in Infants. (a) Bauh. lib. 16. c. 1. p. 217

A FRUIT in shape somewhat like a WILD CUCUMER; yet not, as that, hairy, but smooth. The Seeds also of both are in figure, colour, and taste, altogether alike. So that perhaps it may not be improperly called *Cucumis Sylvestris glaber*.

A FRUIT, supposed by *Clusius*, (b) to be that of the EGYPTIAN-BEAN of *Dioscorides*, a Water-Plant. 'Tis of a brown Bay, and of a softish and light substance; the top, which is broadest, above three inches over, and flat; divided into about twenty round and open Cells, almost like an *Honey-Comb*. In each Cell is contained a *Bean* or *Nut*, alike colour'd, of an Oval shape, as big as a small *Akorn*, and in the same manner pointed at the top. See also the Figure in *Bauh*. (b) Exot. lib. 2. c. 13.

A slender COD of GUINY-PEPPER. *Capsici Siliqua angusta*. *Piso* (c) describes and figures nine or ten sorts, all growing in *Brasile*, and there called *Quiya*; of which this is the longest and most slender. 'Tis used as a great Stomachick Medicine, and in Sauces, both in substance and infusion, in *America*, *Spain*, and other Countries, and by many prefer'd before the best *Pepper*. (c) Hist. 1. 4. c. 51.

The COD of the Broad Leav'd DOGSBANE. *Siliqua Apocyni latifolij*. Given by *George Wheeler Esq.* Described and figur'd in *Baubinus*: (d) but with the Cods shorter and thicker than their natural shape. Of kin to that which *Lobelius* calls the *Scammony* of *Montpelier*. Along the middle or centre of the *Cod*, runs a slender fibrous pillar, to which, and not to the sides of the *Cod*, the Seeds are fasten'd on both sides it; and so encompassed about with *Down*, wherewith the *Cod* is fill'd up. A provident forecast of Nature to keep them warm. The said *Down* consisteth not of single Hairs, but *Plumes*, affixed to the Seeds, wherewith they are winged for their being more dispersedly wafted by the *Aer*, and prevent their falling in a ruck on the ground. (d) L. 15. c. 15. p. 135.

The

The CODS of the wild WOAD, (*Glasti Sylvestris*) together with the Seeds therein contain'd.

A small SPIRAL FRUIT. Above an inch long, and $\frac{1}{2}$ over. It consisteth of five little Cods, all growing upon one Stalk, and thence twisted all together (as several strings in a Rope) are at the end united in a slender point.

The WATER-CALTROP. *Tribulus aquaticus*. Described in *Baughinus*. A kind of shelly Fruit of a brown colour; divided into four thick and sharp-pointed Spikes, quadrangularly. In the centre of which is lodged a white and well tasted Kernel. They grow in the Rivers and Lakes in *Italy* and *Germany*. Where, in times of scarcity, the people make *Bread* of the Kernels.

Some EARS of *Tangier* WHEAT. Given by the Honourable *Charles Howard* of *Norfolk* Esq;. The Plant described in *Baughinus* by the Name of *Triticum cum multiplici Spicâ*. For it is a great broad Spike, as it were branched out into several little lesser ones; yet all closely compacted: in the middle $\frac{1}{2}$ inch thick, and an inch and $\frac{1}{2}$ broad; four long, and sharp pointed.

Some more EARS of the same sort, brought from *Portugal* where it grew.

CHAP. III.

Of S E E D S.

THe THICK FRENCH-BEAN. *Phaseolum maxime tumidum*. An inch and $\frac{1}{2}$ long, $\frac{1}{4}$ broad, and $\frac{1}{2}$ an inch thick. The seat of the *Bean*, or of its *Placentula*, that is, the part whereon it grows, as long; of a brown colour, with a black *rim*.

The slender FRENCH-BEAN, of several sizes and colours, *sc.* Red, Black, White or Ash-colour, and the same spotted with black. Although these are quite different from the *Fabaceous* kind, yet I have retained the *English* Name, because in use.

The ROUND scarlet *Phaseolus*. *Abrus coccineum majus*.
 (a) Lib. 17. *Baughinus* (a) describes it under the Title of *Pisum Americanum*; improperly, for that the *Peasen*, and the *Phaseolous* kind,
 p. 264.

kind, are very different. And for the Figure hereof, by some oversight, is placed that of a sort of *Palme-Nut*. 'Tis a scarlet Fruit about as big as a *Rounseval Peas*, and somewhat flat.

The LESSER AMERICAN-BEAN. About $\frac{3}{4}$ of an inch broad, almost square, and very thick. The seat of the *Placenta*, black; which reaches almost half round the *Bean*. Here are preserved both Black ones, and of a Scarlet or Coralline colour.

An ORBICULAR *Indian* PEAS. A large one, *sc.* $\frac{3}{4}$ of an inch Diameter: of a shining straw-colour, mixed with yellowish *Striæ* as it were in rings: not much unlike the little round stones wherewith Children play, called *Marbles*.

Another ROUND *Indian* PEAS. About as big as the former, and also round. But somewhat flat on both sides, as a *Loaf*. And of a whitish colour.

An OVAL *Indian* PEAS. A very large one, *sc.* near an inch long, and above $\frac{1}{2}$ an inch over; of a long Oval Figure, so as to resemble a *Sparrows Egg*. But of a shining blewish ash-colour, like a *Jaspis*. *Baehinus* (a) figures and describes a Fruit (or Seed) pretty like to this, with the Name of *Phaseolus Ovo Columbino ferè similis*. But by his Description it is neither of the *Phaseolous*, nor *Fabaceous*, but of the *Peas-kind*; as both This, and the two precedent ones, also are. The *Characteristick* of which kind is, To have the *Placenta*, and so the *Seat* of it, always very small.

(a) Lib. 17:
p. 276.

The GUINEY-PEAS. Described in *Baehinus* by the Name of *Pisum Americanum coccinem* *f. Abrus minus*. Although the *Abrus majus* be of the *Phaseolous* kind. 'Tis of the bigness of a young *Peas*, of an Oval shape, and Scarlet colour, when fresh very pure; and adorned upon the seat of the *Placenta* with a black spot. Here are some also of the same sort, all over black. They grow in *Madagascar* and *China*; where they eat them not, but only use them for weights. In *Europe*, sometimes for *Necklaces* and *Bracelets* for the *Wrists*.

The great CICHE. *Cicer rufus major*. In *Italy*, *Spain* and *France* *Ciches* are commonly sown (as *Clover-Grass*) in the Fields. In some parts of *France*, they use them not only medically, but for food.

H h

The

The great LENTIL. *Leus major*. This also is sown, in France, in the Fields, as the *Ciche*.

The great Wild VETCH. *Vicia maxima sylvestris*.

(a) Lib. 17. c. 19. The CANDY VETCH. *Arachoides Honorij Belli*, f. *Cretica*. Described, in *Bauhinus*, (a) by the Author from whom the Name. The Seed it self, like a little *Lentil*. Seldom more than one in a *Cod*. The *Cod* is short and broad, about the bigness of a *Silver Half-peny*; On the outside cancellated or favous, almost as in the seed of *Poppy*.

(b) Ibid.

What *H. Bellus* affirms (b) of this Plant, is observable, sc. That it bears *Cods* not only on the Stalk, but also on the Roots under ground.

The KIDNEY-VETCH. *Semen Anthyllidis leguminosæ*.

The CRIMSON GRASS VETCH. f. *Catanance*.

The MEDICK FITCHLING. f. *Onobrychis*.

The EVERLASTING VETCH; so it seems to be. *Vicia multiflora perennis*.

The EVERLASTING PEAS. *Lathyrus perennis*.

The PRICKLY HEDG-PARSLY Seed. *Semen Caulididis echinatum*. f. *Lappulæ Canariæ latifoliæ*.

The Seed of MACEDONIAN PARSLEY.

The AZORICK sweet FENIL Seed. Shaped like that of the Shops, but much less.

The Seed of the stringy BIRTHWORT of *Virginia*. f. *Pistolochiæ Virginianæ*.

The Seed of *Indian* SCABIOUS. Somewhat bigger than the common.

The Seed of the BUGLOSS with the yellow Flower.

The Seed of a SENSITIVE Plant. f. *Herbæ mimosæ*. There are several *Species* described by *Clusius*, and others. That of *Clusius*, about five handful high, and hath the tast and smell of *Liquirish*. This Seed is of a dark brown, not much bigger than that of a Purple Stock, angular, and frequently of a *Rhomboidal* Figure. It takes its Name (as is commonly known) from its Imitation of sense or Animal motion. For so soon as you touch the Leaves, they presently fall, till they lie upon the ground. After a while, they rise again; but being touched, fall as before.

The Seed of VENUS LOOKING-GLASS. Of the shape

shape and bigness of a *Fly-blow*, but of a dark glistering colour, like polish'd *Steel*. Figur'd and describ'd by Mr. *Hook*. (a)

(a) Micro-
graphia.

The Seed of PRICK MADAM; *Sedi minoris*. In colour, shape and bigness, almost like to that of *Pancy-Seed*, or the *Viola tricolor*, but a little less.

The Seed of Wild GARLICK.

The SEED of the *Carduus* headed HAWKWEED. The Plant described by *Bauhinus*, but not the Seed. 'Tis $\frac{1}{2}$ of an inch long, as thick as that of the lesser *Hawkweed*, and of a yellowish straw colour; a little crooked, with the top swell'd and pointed, and view'd in a Glass, appears wrinkled round about.

The lesser *Champaine* TREACLE MUSTARD-Seed. *f. Thlaspios Campestris*.

The Seed of the great STAR of BETHLEHEM. *f. Ornithogali fl. pleno*. Of the bigness of *Mallow-Seed*, and very black; on one side round, on the other angular.

The Seed of the VERVAINE MALLOW of Japan. *f. Alceæ Japonensis*. As small as that of the common *Mallow*, but longer and more like a *Kidney*; of a brownish yellow, yet cover'd with a white, thin, and very short *Down*.

Summer WHEAT of *New England*. So call'd (though less properly) because sown and ripe the same year. Whether from the Nature of the Grain, or the Soil and Climate, trial hath not been made.

SECT. IV.

Of MOSSES, MUSHROOMS, &c. Together with some Appendents to Plants.

OF MOSSES here are about four and twenty *Species*. Most of them gather'd in a Wood in *Surrey*, and given by *John Evelyn, Esq.*

The CREEPING TREE MOSSE of *America*. 'Twas found betwixt *Virginia* and *Florida*. It consisteth of several Threds, somewhat thicker than a *Taylors*, cover'd all over with little skiny Scales, hardly visible without a Glass.

The greater number of these Threds put forth two or three more, and so those as many, repeating them after every two inches, all of equal thickness. In which manner they spread wonderfully both in length and breadth. 'Tis probable, that under those little Scales may lie the Seed of the *Mosse*.

The SHIELDY Tree MOSSE. *Muscus arboreus scutellaris*. So called, for that it grows with several broad round Heads, from a $\frac{1}{4}$ to $\frac{1}{2}$ an inch over, and a little Concave, not unlike a *Buckler*. Described and figur'd in *Bauhinus*.

The soft BEARDED Tree-MOSSE. *Muscus arbor: barbat. Imperati*. Described by the Author of the Name. It consisteth of a great number of strings in a cluster; some of them at the bottom, as thick as a Knitting-pin, and $\frac{1}{2}$ a foot in length; all ending as small as a fine Thread; and not unaptly resembling a Beard.

The Crisp BEARDED MOSSE. Different from the former, only in being more rough and woody.

The FISTULAR Tree-MOSSE. Described in *Bauhinus* by the Name of *Muscus arbor: Villosus*. By whom it is mistakenly said to be woody: it being wholly of a pithy substance, and having all its Branches hollow as so many little Pipes: from whence I have nam'd it.

The Dwarf PIPE-MOSSE. Different from the precedent in being shorter, and more spread thick and bushy. That which is called *Usnea Officinarum*.

The HORNEED Tree-MOSSE; consisting of short crooked Pipes.

The greater FLAT-MOSSE. *Muscus arbor: ramosus, s. latiramis major*. Figur'd, as if it were nothing else but a branched Skin.

The dwarf FLAT-MOSSE. *M. latiramis humilis*.

The CROWNED FLAT-MOSSE, having a flat Head or Crown on the top. Thus far of *Tree-Mosses*.

The greater CAPILLARY-MOSSE. *Polytrichum majus*.

The lesser CAPILLARY-MOSSE.

The greater BRANCHED Ground-MOSSE. Described and figur'd in *Baub.* with the Title of *Muscus terrestris repens à Trago pictus*.

The

The lesser BRAINCHED Ground-MOSSE. *Muscus terrestris ramosus minor*. Of the same Species with the Skull-Mosse. Described in *Baubinus*, as I take it, with the Title of *Muscus Abietis facie*.

The FIRN-MOSSE. *M. filicinus*; so called from its likeness to a young *Firn-Branch*.

The TOOTHED-MOSSE. *M. terrestris denticulatus*. The several strings hereof, border'd on both sides with jagged or toothed Membrans. Figur'd and describ'd in *Baubinus*, under the Name of *Muscus pulcher parvus repens*.

The smallest CREEPING MOSSE. *M. terr. repens minimus*.

The lesser ground MOSSE with REVERTED Leaves; that is, with their points doubled backward. So small, as hardly to be observed distinctly without a Glass.

The CROWNED Ground-MOSSE. The Branches hereof are of an ash-colour, $\frac{1}{2}$ an inch long, flat and skinny, and crowned at the top with round, flat, and blackish Heads.

The greater FISTULAR Ground-MOSSE. The Pipes of this *Mosse* are also of an ash-colour, about an inch long, and as thick as an *Oaten straw*.

The lesser FISTULAR MOSSE. The Pipes of this are an inch and $\frac{1}{2}$ high, and as thick as a good big *Needle*.

The FLORID FISTULAR MOSSE. *M. Tubul. Efflorescens*. The Pipes of this are also ashen, slender, an inch long, with jagged and redish Heads, somewhat like little *Flowers*.

The CUP-MOSSE. *Musc. Pyxidatus*; so called, because its several Sprigs have Concave Heads like little *Cups*.

Of Mosses, it may be Noted, That they are all comprehended under two general kinds. One whereof, is properly to be called *WOODY*, or That, in which we find a stringy or fibrous Part, included within a *Cortical*: and are therefore to be number'd amongst perfect Plants. Of which sort, are the *Terrestris repens*, *Denticulatus*, *Ramosus*, *Capillaris*, *Filicinus*, *Folij retroversis*, *Barbatus*, *Scutellatus*, & *Americianus*. The other simply *CORTICAL*, whether flat or round; and therefore to be reckon'd of the Family of Imperfect Plants.

Of

Of which sort, are the *Pyxidatus*, *Terrestr. Tubularis*, *Arboreus Tubularis* f. *Usnea offic. Latiramis*, *Latiramis Coronatus*, *Corniculatus*, *Terrestr. Coronatus* & *Tubul. efflorescens*.

The Jagged Tree-LIVERWORT. *Lichen arboreus laciniatus*.

The Curled Tree-LIVERWORT. *L. laciniatus crispus*.

A Great FISTULAR MUSHROON. So I call it. Given by Sir Rob. Southwell. I find no Description of this *Species*. They commonly grow upon the *Elm*. This is $\frac{1}{2}$ a Cone, as having grown to the side of the Tree without stalk. The Diametre of the *Base*, near $\frac{1}{2}$ a yard; from whence it rises above $\frac{1}{4}$ of a yard in height, narrowing all the way to the top. Girded with several Rings of various breadth. Outwardly, very hard and dense. Inwardly soft and compressible, like a *Pith*, and is in substance really such. Consisting of an innumerable company of small soft *Fibers*, wrought together almost as pure fine Wooll in a Hat. The bottom is all over perforated with *Pores*; of the bigness of those little *Foveæ* in the seeds of *Poppy*; and are the extremities of as many small strait and parallel Pipes of a considerable length; probably, almost through to the top, as I have seen them in a lesser of the same kind. These *Pores* or *Pipes* may be distinctly seen without a Glass. With one, a *Slice* of the *Mushroon* looks like a piece of wood out of which *Button-Moulds* have been turn'd. Both the substance of the *Pipes*, and of the other parts of the *Mushroon*, so far as visible, is answerable only to the *Cortical*, or pithy Part of a Plant. So that it seems to be but half of a perfect Plant: or wanting the Lignous Part, by which all Plants receive their various Figures, is a kind of Vegetable *Mola*; in comparison, a rude misshapen thing.

(a) See the Authors two last Books Of Plants, the former Of Roots, the latter Of Trunks; especially this, latter.

That which hath formerly (a) been by me observed with the help of Glasses, by the *Pith* of this *Mushroon* is further confirm'd, and clearly represented to the naked eye, *sc.* That the *Pith* of a Plant, as well as the Wood, is wholly fibrous.

A smaller FISTULAR MUSHROON, about four inches in diametre. In which the aforesaid Pipes apparently run parallel for the length of near two inches and $\frac{1}{2}$, or from the bottom almost to the top.

A THIRD and FOURTH still lesser than the former.

Part of the CORK-MUSHROON. 'Tis eight inches in Diametre, exactly of the colour and substance of the best *Cork*, sc. light, soft, compressible and springy: from whence I name it. In the middle, an inch and $\frac{1}{2}$ thick, the Circumference very thin; the upper side solid, the under divided into several Plates by the Diametre, frequently so joyn'd together, as to make a great many little Cells, somewhat like to those in a *Honey-Comb*.

The SPONGE MUSHROON. So it may be call'd, for that it is porous almost after the manner of some *Sponges*, particularly the *Cup-Sponge* hereafter describ'd. And is also of the same colour. But hath the substance of a *Tree-Mushroon*.

The CORAL-like MUSHROON. Described in *Bauhinus* amongst Mosses, with the Title of *Muscus Coralloides*: Figur'd by *Lobelius*.

The SCARLET CATSTAIL MUSHROON of *Malta*: *Fungus Typhoides coccineus Melitensis*. Given by Sig^r. *Boccone*, and by him described and figur'd. (a)

The round Venimous MUSHROON of the *Hazle*. *F. Coryleus orb. venen.*

(a) Desc.
Plant. Rari-
or.

The HART-FUSBAL. *Tuber cervinum f. Cervi Boletus*: So called, from a false Opinion, that they are there only found, where *Deer* go to *Rut*. Described by *Bauhinus*.

~~Magr. 12 bag~~ ~~THE SCARLET CATSTAIL MUSHROON~~. I find no Description hereof. 'Tis in length $\frac{1}{2}$ a foot; at the lower part, half an inch thick, or in Diametre; in the middle, two inches and $\frac{1}{2}$; the top, oval or elliptick; not unaptly resembling the *Boon critton-Pear*. Of a brown colour, ~~solid~~, dense, ~~and tough~~; and tough, almost like *Glew*. Being fir'd, it burns with much flame, melts into a good deal of Oil, and yields a smoak of a grateful *Aromatick* smell. See p. 385

The KERMES BERRY. *Coccum f. Granum Infectarium*. Commonly, but absurdly, so called; as not being a Fruit, but only a round *Ball* or *Button*, nourished on the Boughs and Leaves of the *Dwarf-Ilex*, or the *Ilex Coccigera*; a kind of *Shrub*, in *France*, *Spain*, and *Italy*, with prickly Leaves, like a little *Holly-Bush*. This Berry when fresh gather'd (which is at the end of *May* and the beginning of *June*) is full of a *Crimson* Juyce, or Pulp, so called, which, for the

the most part of it, is a heap of small red Mites. And containeth also, as is probable, one or more *Maggots*, which feed upon the *Mites*.

The said Juyce or Pulp (as it is called) is made use of for the Confection of *Alkermes*, and other purposes. For the *Deyers* use, the *Berrys* are spread abroad upon Linnen, and to prevent heating, turned twice a day. When the *Mites* creep out and cover the *Berrys*, they are sprinkled with *Vinegar*, and rub'd a little, and so separated by a *Searce*; repeating, till the *Berrys* yield no more. Of this Pulp, Powder, or Heap of *Mites*, are formed little *Balls*, and so exposed to the Sun to dry. The use of the *Vinegar*, is to kill or weaken the *Mites* and *Maggots*; which otherwise would turn to little *Flys* (rather *Bees*.) The empty *Husks*, being washed with *Wine* and dry'd, are put up in *Sacks*, either alone, or with a quantity of powder in the middle. This Account I have drawn up out of the Observations communicated by Dr. *William Croon* (a) from Mr. *Verny* an *Apothecary* at *Montpelier*, and those of Mr. *Lyster*, (b) which illustrate each other.

(a) Phil.
Transf. N. 20.
p. 363.
(b) Ibid.
N. 87.
p. 5059.

To the *Remarques* above mention'd, I shall add one more, which is, That as the Pulp or Powder, so called, is a Cluster of small Animals: so the Husk it self is an Animal Body, as it were grafted on the Stock or Leaf, whereon it grows; and so converteth all the nourishment it deriveth thence (as *Bread* eaten is turned to *Flesh*) into its own Animal Nature. And that the said Husk is really an Animal Body, appears by that *fetid* scent it gives, like that of Horns, Hair, and the like, upon its being burnt. A property, which I find belonging to no Plant whatsoever, except to some *Sea-Plants*, as in the following *Section* shall be instanced. So that, though in compliance with the Vulgar Opinion, I have placed it here, yet ought it to be treated of amongst Animals.

English KERMES BERRYS. Observed, and sent by *Martin Lyster Esq.* Together with several *Remarques*, relating both to the Foreign kind, and to This. (c) This, he found upon the *Plum*, *Vine*, and several other *Trees*, especially the *Cherry*. The *Husk* of a *Chesnut* colour, containing four or five *Maggots* of the *Bee-kind*, producing a *Bee* less than an *Ant*; together with a Pulp or Heap of *Mites*,

(c) Phil.
Transf. N. 71.
p. 2165. N.
72. p. 2177.
N. 73. p.
2196. com-
pared with
N. 87. p.
5059.

Mites, (as the other *Kermes*) on which the *Maggots* feed. The empty *Husk*, rub'd upon a white Paper, tinged it with a beautiful *Purple* or *Murrey*.

The principal difference which I note betwixt the Foreign and these *English Berrys*, now dry, is, That in those, the powder is red, and more bitter, in these white, and less bitter. But whether the powder in these also was not once red, I cannot say. For in some even of the Foreign *Berrys*, I find it white. Which I the rather note, that they may be separated by *Apothecaries* from the rest, as being stark naught.

COCHINELE. *Coccus Radicum*. The former Name, seemeth to be but the diminutive of *Coccus*. The latter, grounded upon the Opinion, That as the *Kermes Berry* grows on the Body and Leaves, so this, on the Roots, of Plants, especially on those of *Pimpinell*; yet in some places only. Further, I find no certain account. To me, thus much seems evident, That 'tis neither a Vegetable Excrecence, as some surmise; nor an *Insect*, as others: yet an Animal Body, as the *Kermes Berry*, by some *Insect* affixed to a Plant; and thence nourished for a time, but gather'd before it be fill'd with *Mites* or *Maggots*. For being held, as the *Kermes Berry*, in the flame of a *Candle*; it usually huffs and swells, but always stinks, like Hair or Horn when they are burnt.

A scruple of *Cochinele* added to an ounce of *Saccharum Saturni*, makes a most curious *Purple*; but I believe fading.

A GREAT GALL, which grew upon that sort of *Oak* described by *Clusius* in the third place; and frequent in *Spain*. 'Tis now of a dark brown, and smooth; of a *Spherical* Figure, with a few small knobs here and there; as big as a little *Apple*, *sc.* near two inches in Diameter.

SECT. V.

Of SEA-PLANTS.

CHAP. I.

Of SHRUBS.

I Find, upon particular Observation, that of SEA-SHRUBS there are two general kinds. Such as are strictly woody, that is, have the colour and fibrosity of Wood, and burn and smell like Wood. And such as are, in a manner, horny, or look, bend, burn and smell like Horn.

A WOODY SHRUB. *Frutex marinus verè ligneus.* 'Tis here cut off from the Root. About a foot in height, with four Branches spread out as broad, and cover'd with several thick Knobs of a sort of softish white *Coral*; the sides of which Knobs are a $\frac{1}{2}$ of an inch thick; the surface almost like that of *Poppy-Seed*.

ANOTHER, near a $\frac{1}{2}$ of a yard high, as thick as the Ring-Finger, with white and hardish Incrustations upon the tops of its Branches. Any strong *Acid* droped on the said Crust, causeth an *Effervescence*: so that it seems to be a Coralline substance.

A THIRD, with the Branches broken, and without a Crust, three or four inches high, and as thick as the middle Finger.

A FOURTH, with the Branches also broken, and without a Crust. 'Tis a small one; but hath a very large Root, curiously spread all over the backside of an *Oyster-shell*.

And it may here be observ'd, That the Roots not only of this, but almost all *Sea-Shrubs*, instead of being Rami-fied, are spread out in the form of a Skin or Membrane, and so stick fast to some hard and steady Body as their *Base*.

Another slender one, about a $\frac{1}{2}$ of a yard high, but the Root broken off.

A FLAT WOODY SHRUB. *Frutex M. ligneus, expansus, ramulis coeuntibus.* In all the former, the Branches are expanded every way: in this, only one way, or in breadth. 'Tis also of a softer substance, and more brittle. Of a Purple colour, almost like the woody part of *Alkanet Root*. Above $\frac{1}{2}$ a foot high, and as broad. Several of the Branches united together, as in the *Sea-Fan*. Some of these *Shrubs* were found near the Straights of *Gibraltar*.

The Horny SHRUBS are also of two general kinds; either with the Branches loose; or else united together.

A great tall H O R N Y S H R U B with L O O S E BRAINCHES. *Frutex Corneo-ligneus major erectior solutis Ramulis.* 'Tis above a yard and $\frac{1}{2}$ high. Consisteth of five or six principal Branches, equal to a *Tobacco-Pipe-Stalk* where thickest; having scarce any callateral ones. Bends like *Whalebone*, and both without and within, looks not unlike to that, or *Black-Horn*. And in like manner, curles, huffs or swells, and stinks in burning. The Root cut off.

ANOTHER of the same, $\frac{3}{4}$ of a yard high, and more branched.

A THIRD, with more numerous Branches than the former. Cover'd with a very thick, but soft Incrustation; originally of a Purple colour, but now for the most part turned brown; curiously perforated, as it were with Pinholes, all round about. Probably the foundation of one sort of perforated *Coral*.

A great ARBORESCENT HORNY SHRUB. Half a yard High, and a foot in breadth, being spread in the form of an *Oak*, with great Branches about as thick as a mans Thumb. The Stock, six or seven inches in compass. The Root spread upon a stony *Base*, and of a brown colour. The Branches black both without and within; and swell, or huff, and stink, like Horn, in burning.

ANOTHER, spread also, in part, as a Tree. Half a yard high, and near as broad. Of a blackish colour; and stinks a little in burning; but swells not. Cover'd with a very thick, but soft purple Crust. To several of the Branches are also curiously fasten'd the WOMBS or NESTS of a certain *Insect*, as big as a *Horse-Bean*, of a roundish figure;

within, whitish, smooth and glossy ; without, cover'd with the said soft and purple Crust.

A small HORNY SHRUB with LOOSE Branches. The Root is curiously spread upon a Stone like a thin skin. The Trunk of a yellowish brown, and thick as an *Oaten straw*, divided into slender Twiggs, to about a foot in height ; flexible, and having a soft and white Pith. Being burnt, they not only send forth a very stinking smoke, but also swell into a light and spongy *Cynder*, just like that of *Whale-bone*, *Cow-Horn*, *Leather*, or other like Animal-Body. Most of them are cover'd with a soft ash-colour'd Crust. Neither Oil of *Vitriol*, nor any other, except a Nitrous *Acid*, droped upon this Crust, causeth an *Effervescence*. Which shews the *Salt* therein contained, to have affinity with that in the stones bred in Animals.

TWO more small HORNY and incrustated Shrubs.

TWO more, growing together on a stony Base, not Incrustated.

A FLAT, HORNY SHRUB, with LOOSE Branches. *Frutex Corneo-ligneus, expansus, solutis Ramulis.* In all the former, the Branches were expanded every way : in this, only one way, or in breadth. The Root spread like a Membrane, upon its Base, as in the former. 'Tis near $\frac{1}{2}$ a foot high, and almost $\frac{1}{4}$ broad, shaped not unlike a *Feather-Fan*, formerly in use. The Trunk $\frac{1}{4}$ of an inch over, divided into a great number of Branches round, black, smooth, somewhat flexible, and having a Pith. In burning they huff and stink, as the former. Cover'd with a soft and ash-colour'd Crust, all over knobbed with little Vesicles, which are sometimes perforated.

ANOTHER more tall, and with both a White or Grey, and Red Crust ; not on the same but several Branches. The former, knobbed ; the other, as it were daubed upon the Branches. Given by Sig^r. *Boccone*, and by him also figur'd.

ANOTHER of these growing Double, or divided next the Root into two spreading and parallel Bodies.

A flat HORNEY SHRUB, with more NUMEROUS Branches. About a foot broad, and near as high. Rooted in a kind of *Brain-stone*. Without any Crust. The Branches, as more numerous, so slender, longer, and more flexible, so as to be somewhat bearded.

ANO-

ANOTHER, with less numerous Branches, and SEMI-PERSPICUOUS, if held up against the light. Above a foot high, and $\frac{3}{4}$ broad. It neither huffs nor stinks so much in burning, as do the former.

A Flat HORNY SHRUB with COLLATEARAL Branches. *Frutex corneo-ligneus filiciformis*, So I name it. In all the former, the Branches are reciprocal, or not of equal height on both sides the great *Stemm*: in this, just opposite, as in a Feather or Branch of the *Male-Firne*. Near a foot high, and five inches broad. The small or side Sprigs are round, as in all the former. But the middle *Stemm* is flat. Both This and the others, *Semiperspicuous*. They stink in burning, but swell not. Cover'd with a soft, purple, knobbed, and perforated *Crust*.

ANOTHER large one, with two middle *Stems*, but all the side Branches broken off. In height $\frac{1}{2}$ an Eln. The Root of a light and skinny substance, spread abroad so, as to make six inches compass.

ANOTHER not so tall as the former, (about a foot high) but the middle *Stems* thicker. The collateral Branches here also broken off.

Another small one: but with the Root curiously spread upon its stony *Base*, like a thin smooth Leaf. Most of these flat *Shrubs* grow in the *Mediterranean-Sea*.

A Flat SHRUB with UNITED Branches. *Frutex expansus, Ramulis coeuntibus*. 'Tis a foot high, and $\frac{1}{2}$ a yard broad. Divided reciprocally into severally Branches, containing a *Pith*. In all the foregoing, the Branches are all loose or separate; in this, some of the smallest meet in one; as Inosculated Veins, or as the *Fibers* in the Leaves of *Plants*. Of a blackish colour, and somewhat *fetid* upon burning. Cover'd with an ash-colour'd, soft, and knobbed *Crust*.

ANOTHER, with the Branches and Conjunctions much more numerous, so as to make very close Work. Near a foot high, and almost as broad. Stinks in burning, and is cover'd with a knobbed *Crust*, as the former.

A Great SEA-FAN. *Frutex m. maximus, RETICULATUS, s. Flabellum marinum maximum*. In the two former, only some, here all the Ramifications are united, so as to make one entire piece of Net-work, in the shape of a *Fan*. 'Tis above $\frac{3}{4}$ of a yard high, and almost a yard and $\frac{1}{2}$ broad.

The

The Root wonderfully spread upon its stony *Base*. For being extended every way, some of its *Skirts* meet underneath, and so embrace it round about. The *Branches* of a blackish brown, and swell and stink, like *Horns*, in burning. Cover'd with a soft *Crust*, originally *Purple*, but now for the most part faded into an ashen colour.

ANOTHER large SEA-FAN, $\frac{3}{4}$ of a yard high, and $\frac{1}{2}$ an Eln broad. Incrustated as the former. It hath this peculiar, *sc.* out of the sides of it, grow several other small *Fans*, about a $\frac{1}{4}$ of a yard long (more or less) and near as broad.

TWO more large SEA-FANS, above $\frac{1}{2}$ a yard high, and as broad. Incrustated as the former. Of one of these *Fans*, and about this bigness, see an elegant Figure in *Calceolarius's Museum*. (a)

THREE Midling SEA-FANS, near $\frac{1}{2}$ a yard broad, and a foot high. Incrustated as the others.

THREE small SEA-FANS. Two of them are a $\frac{1}{4}$ of a yard high, and as broad. The Third, is less. Yet hath several little netted *Labels* growing on the side. All three incrustated, as before.

A SEA-FAN with CLOSE Net-work. Whereas the former consisted of more open work; as by comparing even a lesser of those herewith, is apparent. Neither hath this any *Crust*. 'Tis $\frac{1}{2}$ an Eln high, and a foot broad. Several of the smaller Ramification, thin or flat, *sc. transversely* to the breadth; looking like little *Splinters* of *Whalebone*. In burning, it swells, and stinks, as the others.

ANOTHER of the same, but not above a foot high, and near half as broad. This also is naked or without any *Crust*, as the former. Most of these *Fans* grow in the *American-Ocean*.

(b) Mus. 1.2.
c. 35. at the
end.

Wormius, speaking of *Sea-Shrubs* (b) hath this passage, ---*Mirum profecto, quomodo hujus generis vegetabilia ex ijs (saxis puta) nutrimentum trahere valeant.* Whereas 'tis plain, That they receive no nourishment from them, but the *Sea-Water*, and such nutritive Bodies wherewith it is impregnated. And it is therefore observable, That although the *Trunk* and *Branches* of these *Shrubs* are of a close and dense substance; yet their *Roots* are always made soft and spongy (especially when recently gather'd) the better to imbibe their

their *Aliment*. So that the use of the Stone, or stony Body, on which they stand, is only to be a *Base* to keep them steady, and in the most convenient posture for their growth.

These, and other *Sea-Plants* hereafter describ'd, stinking, as is said, like Horns, in burning, and some of them not un- easily procur'd, it may be worth the Trial; Whether in *Hysterical*, *Epileptick*, or other like Cases, they may not prove more effectual, than Animal Bodies.

CHAP. II.

Of other SEA-PLANTS, and of SPONGES.

THE HORN-PLANT. *Tuba marina*; as it may be called from its form. 'Tis about two yards and $\frac{1}{2}$ high. At the bottom, not two inches about; from whence it grows thicker all the way to the top, where it is seven inches in compass, and of an Oval Figure. Hollow quite through from the top till within about two feet of the bottom. The sides no thicker than a *Hazle-Nutshell*. Not woody, but tough, like the young Barque of a Tree, or a piece of tan'd *Leather*; and within, of a like colour; but black without. It grows in the *West-Indian Ocean*. The *Indians* cut off the top and so much of the small end as is solid, and lining the inside with a sort of Glew, or of Lacker, make themselves Horns hereof either for Hunting, or other use.

A Tuft or Bunch of CORALLINE. Described and figur'd by most *Botanicks*. I add (what I think is unnoted) That the inward part of this *Plant* is truly Ligneous or Fibrous: the outward, from whence its Name, being only a *Crust* growing upon it, as in the *Shrubs* above described. 'Tis esteemed an excellent Remedy against *Worms*.

FLAT CORALLINE, as it may be called, or Spangle-Wort. Described in *Bauhinus* (a) by the Name of *Opuntia* (a) Lib. 39. *marina*. By *Ferranti Imperato*, (b) with the Name of *Serot-* c. 30. and figur'd. *lara*. It consisteth wholly of Leaves, joyned edge to edge, as (b) Lib. 27. in the *Indian-Fig*; Somewhat round, and scallop'd, and not much

much bigger than a silver *Spangle*. The inward part of the Leaves is fibrous, and by small woody Threds are tacked together. But, as in *Coralline*, covered all over with a white *Crust*; which, in like manner, makes a strong *Effervescence* with *Acid* liquors.

The BEARDED SEA-WRACK. *Fucus capillaris tinctorius*, f. *Roccella*. Figur'd in *Imperatus*; (a) And out of him, in *Bauhinus*. (b) But without a Description. Neither will it admit an exact one, now dry. 'Tis three inches and $\frac{1}{2}$ high, and five or six about. The Root, in compass, two inches, one in height, divided into a great number of small capillary Branches or Sprigs, thick set, as in a *Broom* or *Beard*, very brittle, and of a faded *Purple*. It grows in the *East-Indies*. Of excellent use, especially heretofore, for the making of *Tinctures* both for *Painting* and *Dyeing*.

A sort of the common SEA-Wrack, called *Alga Vitroriorum*.

The BLADDER'D SEA-WRACK. *Alga Vesicaria* f. *conifera*, as it may be called; having on the tops of its Branches several Conick Bags, an inch, or an inch and $\frac{1}{2}$ long, warted round about, and originally fill'd with a light and fuzzy substance.

The WARTED SEA-WRACK. *Fucus verrucosus Imperati*. (c) On which grow a great many vesicular and soft Knobs all along the Branches, as well as on the top.

The BROADEST SEA-WRACK. *Alga latissima Membranacea*. The Root hereof, stringy. The Stalk, round, as thick as a *Goose-Quill*, and about five inches high. From thence 'tis spread, by degrees, into a thin Skin too inches and $\frac{1}{2}$ broad.

ANOTHER of the same *Species*, but not so broad.

The POUNCED SEA-WRACK. *Alga marina πλατυκερως*, *Bauhino*. *Poro Cervino*, *Imperato*. 'Tis wholly distributed into flat Branches, a $\frac{1}{2}$ of an inch broad, almost after the manner of a *Stags Horns*. Of a russet colour, and as it were all over pounced, somewhat after the manner of a *Rue-Leaf*, or that of *St. Johns Wort*, when held up against the light.

The SPIRAL SEA-WRACK. It winds about, very curiously, with a great many Circumvolutions, almost like a very deep *Skrew*. Described, figur'd, and given by Sig^r. *Boccone*. (d) The

(a) Lib. 27.
(b) Lib. 39.
(c) Lib. 27.
(d) De Plantis Rariorib. p. 70. Tab. 38.

The SEA-MILFOYLE. *Myriophyllum pelagium*. f. *Muscus maritimus filicis folio*. *Clusius* hath a Figure somewhat answerable to this Title, and out of him *Bauhinus*. Yet either it is faulty, or of another *Species*. His, represented with alternate Branches. Here, they are collateral, as in the *Male-Firne*. And curiously denticulated, in the like manner. It grows in very deep Gulfs of the Sea.

This Plant hath the same odd property, with several of the *Sea-Shrubs* before described; which is, that being fired, it makes a strong stinking smoak, like that of burnt Bones, Horns, or other parts of Animals. And may therefore be deservedly commended by *Cortusius* against *Worms*. And 'tis probable, all the rest of the stinking kind, some of which are much more plentiful and easily procur'd, may have the like Virtue.

The STEM of another *Sea-Plant*, Perhaps of affinity with that in *Bauhinus*, entitled, *Coralloides lenta fœniculacea*. The several Sprigs hereof are toothed, as in the *Sea-Milfoyle*, but with finer or smaller Work. It stinks, upon burning, as the former.

SEA-HEATH. *Erica marina*. Described and figur'd in *Bauhinus*. Who yet omits the coalition of all the Branches in a round and plain Base.

SEA-MOSSE, somewhat like the *Sea-Heath*. The Branches hereof are united in a short Trunk. From whence they rise up to the height of three or four inches, and are then multipl'd into others. About the thickness of a small *Rush*, all over shaggy, with fibrous hairs or bristles. Hath a stinking smoak, as the former.

The BEARDED SEA-MOSSE. A Congeries of tough or pliable, yellowish, capillary Threds or Strings, almost cylindrical, or of the same thickness from the bottom to the top; where the most part of them are as it were horned or forked. It makes a crackling noise, in burning, and stinks, but less than the *Sea-Milfoyle*.

The FISTULAR SEA-MOSSE. *Bauhinus* describes a *Sea-Plant* (without a Figure) by the Name of *Fucus cavus*, but of a quite different kind; sc. with the Leaves like a *Fillet*. Whereas this is a Cluster or Brush of cylindrical, pellucid, and strait unbranched Pipes, about the thickness of a great stitching Needle.

SEA-BLOBBER. *Vesicaria marina*. *Spuma Maris Cæsalpino*. *Bauhinus* describes two sorts, That, which is branched; and This, which is not. 'Tis a Cluster of small roundish Bladders, almost in the shape of little *Oystershells*; of a light brown colour, all over veined with Fibers, like the uter Cover of a *Plumstone*. Which makes it the more doubtful, whether it be an Animal Body, or a Vegetable. Which soever, it is supposed the *Matrix* of a *Sea-Insect*.

Another CLUSTER of the same sort, but consisting of smaller Bladders.

The ROPED SEA-BLADDER. I find it no where mention'd. This is also wrought with fibrous Veins, as the former. But the *Bladders* are of a different shape, not with convex, but flat and parallel sides, and the Fibers principally running along and near the edges. Neither are they cluster'd in a lump, but joyn'd together, one after another, with a Ligament of the same substance, almost like a Rope of *Onions*; saving that they are all on one side. They stink, upon burning; supposed to be the *Matrix* of those Shells whereof the *Indians* make a sort of Money, which they call *Wampanpeage*.

A GREAT SPONGE, of the common kind; of a flat Oval Figure, and almost a yard and half in compass.

The SHAGGY-SPONGE. *Spongia Villosa*. It hath no regular shape. Of a Texture more rare, than of most if not all the other kinds. And with small short capillary Fibers, as it were shagg'd all round about.

The FUNEL-SPONGE. *Spongia Infundibularis*. Described in some sort by *Clusius*, and from him by *Wormius*. Figur'd by *Bauhinus*, without a Description. This here is two inches and $\frac{1}{2}$ in height; the *Rim*, near three inches over. The sides about $\frac{1}{4}$ th of an inch thick. Of a Texture far more compact and close, than the common *Sponge*. Yet the Surface all over wrought with little round Pores, almost as in a *Poppy-Seed*: in some places visible to the naked eye, but better through a Glass. On the inside, they are in some places a little bigger, and near the *Rim* disposed into short Rays. Its *Base*, instead of a Root, as in *Sea-Shrubs*, is spread out upon a hard stone, to a considerable breadth.

The Little BRANCHED SPONGE. Of much alike

Texture

Texture and colour with the common kind. But finely rising up and distributed into several Branches, solid or not hollow, about $\frac{1}{4}$ of an inch over, like a sprig of *Coral*. Given by Sig^r. *Boccone*.

The BRUSHY-SPONGE. This also is branched, and the Branches not hollow. But much more numerous. The Trunk somewhat dense, two inches high, and thick as a *Goose-Quill*. Divided into three principal Branches, and these into about thirty more of the same thickness with the Trunk it self, two or three inches long, perforated with some larger pores, as the *Funel-Sponge*, and near their tops, a little flat, and forked.

The CATSTAIL-SPONGE. This also is ramify'd, *sc.* into three large Branches, not hollow, rising up strait, and immediately from the Root, to a foot in height; below, $\frac{1}{2}$ an inch over; at the top an inch, not unlike the Head of the *Typha major*, or a *Cats-Tayle*. To these, three other lesser Branches are appendent. All of them of a blackish colour, and a rare Texture, but the Fibers somewhat more thick and stubborn, than in the common sort, and so woven, as to make some larger superficial Pores. The Root or Base is spread out upon a stone. The *Ramous Sponges* are sometimes found about the Islands of *Fero*.

The HOLLOW CONICK SPONGE. About a quarter of a yard high, and half a yard about. It consisteth of fistular Branches, of a Conick Figure, rising higher and higher, smooth within, without porous, and as it were a little jagged.

The HOLLOW CYLINDRICK or PIPE-SPONGE. From the Base rise up four or five Pipes, above an inch over, smooth within, and tuberculated without, with some resemblance to the *Corallium Verrucosum*. Its Texture somewhat closer, than of the common *Sponge*.

The FLAT HOLLOW SPONGE. Near five inches high. Below, above two inches broad; above, more than three. Consisteth of two flat yet hollow pieces, above four inches deep; but without, distinct for the space only of an inch and $\frac{1}{2}$. Within also smooth, and without tuberculated, as the former, but more bluntly.

All *Sponges* stink, more or less, upon burning, as the

Horny Sea-Shrubs. So that it is a property belonging to most of the Vegetable Productions in the Sea.

It is the Opinion of some, that *Sponges* have sense, because said to shrink, if they are pluck'd; and are therefore reckon'd amongst *Zoophyta*. But of that property I doubt very much. For a *Sponge* being a springy Body, and so extensible, and yielding a little to one that plucks at it; so soon as he lets his hold go, it will, from its elasticity, shrink up again. Which motion of restitution, some probably, have mistaken for the effect of ~~a~~ *Sense*.

No *Sponge* hath any Lignous Fibers, but is wholly composed of those which make the Pith and all the pithy parts of a Plant. Yet vastly thicker, and their Texture much more rare or open, so as to be visible to a good eye, especially assisted with an ordinary Glass. So that a *Sponge*, instead of being a *Zoophyton*, is but the one half of a Plant.

PART III.

Of Minerals.

SECT. I.

Of STONES.

CHAP. I.

Of ANIMAL BODIES PETRIFY'D;
and such like.

IT hath been much disputed, and is not yet resolv'd, of many subterranean Bodies, which have the semblance of *Animals*, or *Parts* of them, Whether they were ever such, or no. And I am not ignorant of the Arguments offer'd on both hands. If I may speak my own sense a little, Why not? Is there any thing repugnant in the matter? Why not a petrify'd Shell, as well as wood? Or is the place? If Shells are found under ground, far from Sea, or in Hills, unchanged; as we are sure they are; then why not petrify'd? Or is the form, to which no *Species* of Shells doth answer? The assertion is precarious: no man can say, how many are known to some one or other; much less, how many are not known: I have reason to believe, that scarce the one half of the under *Species* of Shells are known to this day. And so for *Artificials*: if *Coyns* are found, every day under ground, then why not sometimes also Pictures, and other Works, in time petrify'd? And although Nature doth often imitate her self; yet to make her in any case to imitate Art, is unphilosophical and absurd: for the one, a natural reason may be given, not for the other. On

(a) Relig.
Med.
(b) Phil.
Transf. N.
108.

(c) Sir Tho-
mas Milling-
ton.

On the other side: although Nature cannot be said to imitate Art: yet it may fall out, that the effects of both may have some likeness. Those white Concretions which the *Italians*, from the place where they are found, call *Confetti de Tibuli*, are sometimes so like round *Confects*, and the rough kind of *Sugar'd-Almonds*, that by the eye they cannot be distinguish'd. To call these *Petrify'd Sugar-Plums*, were senseless. What if we find in some Stones under ground the likeness of a *Cross*? Doth not *Sal Ammoniac* often shoot into millions of little ones? Or do we find in other Stones the resemblance of Plants? Why not naturally there, as well as, in Frosty Weather, upon *Glass Windows*? Or as *Salts* sometimes figure themselves (as *Sir Th. Brown*, (a) and *Dr. Daniel Cox* (b) observe) into some likeness to the Plants whereof they are made. Nay, why not too, a Face, or other Animal Form? Since we see that there are divers *Palm-Nuts* which have the like. That the Volatile Salt of *Harts-Horn*, will shoot it self into the likeness of little branched Horns. That of *Flesh* or *Blood*, into the shape of little flat fibrous *Tendons* or *Muscles*, as I have often observ'd. And though I have not seen it my self, yet I have been told by one (c) that doth not use to phancy things, that the Volatile Salt of *Vipers*, will figure it self into the semblance of little *Vipers*. But there can be no convincing Argument given, why the Salts of Plants, or Animal Bodies, washed down with Rains, and lodged under ground; should not there be disposed into such like figures, as well as above it? Probably, in some cases, much better, as in a colder place; and where therefore the Work not being done in a hurry, but more slowly, may be so much the more regular. I shall now come to the Particulars, and leave the *Reader* to judge of them.

Part of the Upper JAW of a strange HEAD, together with some fragments of other Bones, and three very Great Double TEETH, or Grinders, all supposed to be of the same Animal. Found, about twelve years since, seventeen feet under Ground, in *Chartham* a Village three miles from *Canterbury*. The Ground within twelve Rods of the River running thither, and so to *Sandwich-Haven*. An Account hereof is written by *Mr. William Somner*: yet without a Description of the *Jaw*. But supposing it to be part of the

the Head of an *Hippopotamus*, takes occasion thence for a Discourse, wherein he endeavours to prove, That all the low Ground from the *East-Kentish* shore, to *Romney-Marsh*, was once under Water, and an Arm of the Sea. Published, since his Death, by his Brother Mr. *John Somner*: in whose Ground these Bones were dig'd up; and by whom they were bestowed upon this *Musæum*.

This *Jaw-Bone*, is only part of the far Cheek; about fifteen inches long, and seven where deepest: yet part of both the ends, and the *Sockets* of the *Teeth* are broken off. The *Orbit* of the Eye, neither so round, nor so big, as in the *Hippopotamus*: yet the *Teeth* far bigger. For the biggest *Grinder* in the Head of the *Hippopotamus* here preserv'd, is less than six inches about: one of these, near eight. And 'tis much, if they belonged to that Animal, that none of the long Cutters which grow before (as is represented in *Tab. 1.*) should be found with them.

Besides, in that Skull of the said Animal, the *Orbits* of the Eye stand so high, and the Forehead lies so low, that it looks like a Valley between two Hills: whereas in this Bone, the Forehead evidently stands higher than the Eye. The Knob also at the Corner of the Eye in this Bone, is six times as big, as in the said Skull. Although this perhaps, as well as the tuberousness of the Bone in some places, may be the effect of its lying so long under ground; as if it were there by a little swell'd in those places: for they are more rare and soft, than the other, and the whole Bone, than the Skull of any grown Animal not bury'd. Considering all together, it seems to me more likely to belong to a *Rhinoceros*, for the being whereof in this Country, we have as much ground to suppose it, as of the *Hippopotamus*. See *Wormius's* Description of the Double Tooth (a) of a *Rhinoceros*. (a) Mus. lib.

A PETRIFY'D CRAB. *Carcinites*. It seems to be of the undulated kind; whereof see the Description in *Rondeletius*. 'Tis very hard and solid, and as heavy as a Pebble. Yet dissoluble with *Acids*. There is one pretty like this in *Aldrovandus*, (b) under the Name of *Pagurus lapideus*. (b) Musæum Metallicum. And another in *Besler*.

A FISH-MOLD. *Ichthyites in modum Typi*. There are several figures of Fishes in Stones in *Besler*, *Aldrovandus*, and *Moscardo*. In *Aldrovandus* also of the Heads of Birds, and Beasts.

Beasts and Men, in *Flints*. *Septalius* hath a Head in *Marble*. And Mr. Boyle (a) a Pebble with a *Serpent* (all but the Head) perfectly shap'd, and coyl'd up in it. All these (except perhaps the last) are either semblances on a Plain, or at least in solid Stones. But this here is hollow, and was so found in the *Island-Sea*. About five inches long; now split into two halves, like those of a casting Mould. On the insides of which, are fairly impress'd the form of the *Spine*, with the *Ribs*, *Fins*, and *Tail*, of a Fish. Without, a long Plate of the same substance, grows to each side; and others cross to these: as if to the Mould of the Fish, were also added that of its Funeral Cloaths.

(a) Of Gems
p. 156.

This Stone, for consistence, is like that called *Saxum Limosum*, soft, unequal, and unpolishable. Of a blewish hue, like that of *Tobacco-Pipe* Clay, with some very small glossy Grains intermixed. Not only Spirit of *Nitre*, but Oil of *Vitriol* droped upon it, dissolves it, and is excited into a violent Effervescence. But the *Saxum Limosum* stirs not with any *Acid*. So that it is to be rank'd amongst the *Gypso-limosa*, or *Calcilimosa*.

A petrify'd BONE, taken out of a *Gravel-pit* in *St. James Fields*, above eight yards deep.

A Stone like the VERTEBRA of a Fish. Given by Sir Philip Skippon. It may be called SPONDYLITES.

Part of the SPINE of another Fish, consisting of several Vertebrae. 'Tis hard and ponderous; yet dissoluble with Acids. It breaks flaky, as the *Lapis Judaicus*, and many others, or with plain and glossy sides.

The TOOTH of a TIGER, growing to a kind of *Limestone*. 'Tis about as big as that described in the First Part, and of the same shape and colour.

A square crooked TOOTH, not much unlike that of a *Bevir*.

A very great DOUBLE TOOTH or GRINDER. 'Tis about five inches long, and two broad; twice as big as a *Sea-Horse's*. The stumps seem to have been saw'd off. The top divided into several Points and Ridges, as other double Teeth. Of a greyish colour and glossy; ponderous, and hard as a *Flint* or the hardest Pebble.

ANOTHER of the same shape, but not an inch long. *Besler* hath one like this, under the Name of *Pseudocorona Anguina*. The

The SHARKS TOOTH. *Glossopetra*: so call'd; for that these Stones were fabled by some to be the Tongues of *Serpents*, in the Isle *Malta* or *Melita*, turn'd into Stones ever since St. *Paul* Preached there. But the *English* Name, is much more answerable to the shape. Which yet is various, as well as the size and colour; as ash-colour'd or black, long or broad, strait or crooked, with the edges toothed or plain. Of the brown, strait, indented and broader sort here are several very great ones. One, three inches broad; and four, long: with the exerted part, smooth; the Root, rough. Every way, in shape, so like the Tooth of a *Shark*, that one Tooth cannot be liker to another. Yet if it be such, then by comparing those in the Head of a *Shark*, with This, That to which This belong'd, to bear a just proportion, must have been about six and thirty feet in length.

A GLOSSOPETRA, growing to a stony Bed. 'Tis of a lightish colour: and was brought as is supposed, from *Melita*.

ANOTHER, of a lesser sort. The Root of this is rough, as of the rest. But not expanded with the exerted part, as is usual, but of a globular Figure.

These Stones are dissoluble with any *Acid*. Whereby it appears, That (besides such Metallick Principles they are sometimes tinctur'd with) they abound with an *Alkalizate-Salt*. They are found not only in *Melita*, but in *Germany*, and many other places. Figur'd by *Aldrovandus* (a) and by others. (a) Musæum Metallic.

DRAGONS TEETH. Given by Sir *Phil. Skippon*. *Glossopetræ Claviculares*. So I call them, because they seem to be of the same kind; and are long and slender, somewhat like a small Nail; and much more like a Tongue (*sc.* of some small Bird) than any of the former.

The GOATS-HORN. *Tephrites Boetij*; from its ashen colour. *Selenites Cardani*; from its almost Semilunar Figure. Inwardly, 'tis of a blewish Grey. Outwardly, mixed with oblique and white streaks. Of a bended figure, yet with one end thicker than the other, not unlike a *Goats Horn*; whence I have taken leave for the *English* Name. Broken at both ends, yet above $\frac{1}{2}$ a foot long, and two inches and $\frac{1}{2}$ where broadest. The Belly or inward *Ambit*;

L I an

an inch over, and furrow'd; the Back somewhat edged. 'Tis found in *Germany, Moravia, Silesia*, and other Parts.

(a) Boet. de
Gennis &
Lapid.

A *Scruple* (a) hereof in powder, is an excellent *Sudorifick*. Spirit of *Nitre* droped hereon, dissolveth it with an *Effervescence*.

The *FISHES EYE*. *Ophthalmites*. A parcel of them given by Sir *Philip Skippon*. 'Tis a kind of *Pisolithus*. But by some of them, the Humors of the Eye, with the *Tunica Uvea*, and therein the *Iris*, are not ill represented: for which reason I have plac'd them here.

SOME other Varieties, from the same Hand.

The *HERMAPHRODITE*. Commonly called *Hystero-rolithos*. By *Pliny*, (b) *Diphyes*, more properly; as representing, in some sort, the *Pudenda* of both Sexes. Well described by *Wormius*. 'Tis a black Stone, not much broader than *Half a Crown*; very hard, and dissoluble with no *Acid*. Accounted an *Amulet* against *Hysterical Fits*.

(b) Lib. 37.
c. 10.

Another of the same shape, but lesser.

A soft *BUTTON-STONE*. *Echinites albus*. Given by *Sig^r Boccone*. Of these Stones there is some variety, with several Names, but confounded by Authors. They all agree, in having some likeness to the shell of the *Button-Fish*. This resembles that most with all small prickles. Of a white colour. Not very hard, and dissoluble, with *Acids*. See an excellent Figure hereof in *Calceolarius's Museum*.

Another of the same Species and colour.

THUNDER-STONE or hard *Button-Stone*. *Brontias*. So called, for that people think they fall sometimes with Thunder. Yet different from the *Ceraunias*. This is shaped like a little round *Cake*. Very hard and indissoluble with *Acids*; being a kind of yellowish and opacous Pebble.

Another, a lesser one of the same Species.

A *THIRD*, also very hard (as all of them are) but *Semiperspicuous*.

A *FOURTH*, which is a whitish *FLINT*, stained with blew specks.

A *FIFTH*, a small one, and having a little flinty Stone growing to the middle of it on both sides. This particularly resembling *Gesner's Ombrias*. (c) Or the Stone sent him by the Name of *Lapis Hyæniæ*. (d)

(c) De figur.
Lapid. c. 3.
(d) Ibid.
c. 12.

A

A SIXTH, somewhat oblong and striated all round about.

The SERPENTS EGG. *Ovum Anguinum*. From the roundness, and form of Snakes Tails pointing upward, and towards the middle of the Stone. This also is an *Echinites*, and by *Ferranti Imperato* called *Histrix Marinus petrificatus*. *Agricola* makes it a sort of *Brontias*. It most resembles that sort of *Button-Fish*, with several Orders of great Knobs or Prickle-Bases, divided by lesser; described in the First Part of this Catalogue.

A STONE with the SIGNATURE of a *Button-Fish* upon it. So that it was once a *Bolus* or Clay.

The soft OVAL HELMET STONE. Given by *Sig^r. Boccone*. So I name it from its similitude to the shell of the *Echinus Spatagus*, (a) which the English call *Helmet--Fish*. (a) See Part I. Oval, to distinguish it from the *Conick*. Soft, as being very brittle, and easily dissoluble with *Acids*. Several of these Stones are figur'd by *Aldrovandus*, (b) with the Name of (b) Museum Metallic. *Scolopendrites*. And some leaves after, divers others not much unlike, with that of *Pentaphyllites* from its likeness in some part also to the *Cinquesoyle*.

ANOTHER of the same kind, with four narrow Furrows, composed of fine short Rays, and meeting in the form of a *Cross*; to which a fifth is added, more broad. 'Tis somewhat hard, yet dissoluble with *Spirit of Nitre*.

The HARD OVAL HELMET-STONE. 'Tis an opacous Flint, and of a dark colour. But figur'd as the former.

ANOTHER, also flinty, and opacous; but betwixt citrine and yellow.

A THIRD, opacous and white.

A FOURTH, with one half, opacous and yellow; the other, whitish and Semiperspicuous.

A FIFTH, somewhat rounder and more depressed than the former; and may therefore more particularly be called *Pentaphyllites*. Some of these *Ambrosinus* (c) hath misplaced (c) Aldrov. M. Metall. with the *Astroites*.

The blunt CONICK HELMET-STONE. It hath, as it were, the Signature of the *Echinus Spatagus*. But rises up in the form of a *Cone*. Of which Figure I have not

yet seen any *shell*. The top is blunt, and of a middle height. Encompassed with five double pricked Rows, all meeting in the fore part of the Belly. The spaces betwixt which, are cancellated much after the manner of the *Sea-Tortoise-shell*. 'Tis a perfect Flint, brown without, and whitish within.

ANOTHER of the same sort, with bigger pointed Rows.

A THIRD, of the same Figure, but soft, *sc.* of a kind of Limy substance, or that of *Gypsum*.

The SHARP CONICK HELMET-STONE. 'Tis a *Semipellucid Flint*. Surrounded with five double pointed Rows, meeting not only on the top, but also at the centre of the Base or Belly. *Besler* figures a small *Conick Helmet*, by the name of *Echinites*: a great one, by that of *Scolopendrites*. And several *Species* hereof are also figur'd by *Al-drovandus*. (a) None of the flinty or other hard Helmet Stones make any ebullition with *Acids*.

(a) Mus. Metallicum.

The HELIX or Stone *Nautilus*; as from its Figure it may not improperly be nam'd. *Cornu Ammonis*; From *Jupiter Ammon*, pictur'd with Horns. Here are several of them, both in size, shape, and substance distinct. I find no Author describing them much broader than the ball of a mans hand. The highest *Boetius* reckons, about three pounds in weight. But in this *Musæum* there is one near two yards in circumference, and proportionably thick. Of an Ash-colour, and somewhat gritty substance. The several Rounds, as it were, carved with oblique waves. Given by the Right Honourable *Henry Duke of Norfolk*. With,

ANOTHER GREAT CORNU AMMONIS almost as big, *sc.* about five feet round about.

A SMALL CORNU AMMONIS, of an ashen colour, and softish substance: yet dissoluble only with Nitrous *Acids*. It maketh but one or two Rounds; ratably, far more swelling, than in the other kinds.

ANOTHER, of a soft and whitish substance; dissoluble in any *Acid*, and consisting of several Rounds.

A THIRD, growing upon a Stone of a like substance. Figur'd in *Calceolarius's Musæum*, and that of *Olearius*; in both under the Name of a *Petrify'd Serpent*.

The CASED CORNU AMMONIS. The outer part of

of this is diffoluble with *Spirit of Nitre*: of a shining blackish colour, thin, and as it were the shell of the far greater part within it. This also is very glossy, and transparent as *Glass*. Of a brittle substance, breaking into square flakes, like those of a flaky *Spar*. Yet no *Acid* will stir it.

The HARD CORNU AMMONIS. 'Tis a perfect whitish and pellucid *Flint*. These Stones are found in *Germany*.

Note, that if one of these Stones be broken, the several Rounds will part so, as the ridges of one, and the answerable furrows of the other, are apparent.

Likewise, that in some of them, there is not only a ridge, but a round part about as thick as the biggest string of a *Tenor Viol*; winding round between two *Circumvolutions*, as the *Medulla Spinalis* runs within the Back-Bone.

The Helick SERPENT-STONE. *Ophites Ammoneus*. See the Description hereof in *Wormius*, with the Title of *Lapis Sceletum Serpentinum ferens*. 'Tis of kin to the *Cornu Ammonis*; wrought all over with *Striæ*, imitating the Scales of a *Serpent*. In some parts of This, rather the jagged Leaves of a Plant. Of a pale Okre colour, but somewhat hard, and dissoluble only with *Nitrous Spirits*.

ANOTHER, which in the room of Scales or Leaves, is wrought all over, and as it were joynted, with futures in the form of an *s*. obliquely waved from the rim towards the centre. Which *Articulations* are not only on the Surface, but, as *Wormius* well notes, in its intimate parts. This is of a dark amber colour, and somewhat hard; yet maketh an *Effervescence* with *Spirit of Nitre*.

The HELICK MARCASITE. *Marcasita Ammonea*. So I name it, for that it hath the same Figure with the *Cornu Ammonis*, and to the first of these in *Boetius*, is next a kin, if not the same. Yet appears to be a sort of *Marcasite* or Gold colour'd *Fire-Stone*; both by its Weight, and *Copperas* Taft. And some of them are cover'd with *Vitriolick Flowers*. *Ambrosinus* (a) figures two of these under the Title of *Crysammonites*: not so properly, as not having a grain of Gold in them.

(a) Mus. Metall. Aldrov.

The HELICK MARCHASITE, having shallow Furrows on the Rim.

ANOTHER, with some also channell'd.

A THIRD, with the utmost round far more swelling, than in the other kinds; having its Centre lying deep, and its front spread wide on both sides.

A FOURTH, of all, the most flat, and with a sharp or edged Rim. Wrought all over, with undulated *Striæ*, almost as in the *Serpent-Stone*. These two last, particularly, figur'd in *Aldrovandus*. (a)

(a) ubi supra.

A FIFTH, with the Rounds, on one side, all concave: so that it looks almost like one split through the middle.

A SIXTH, beded within a tubercled *Fire-Stone*.

Several small ones, of the kinds above-mentioned.

The SHORT WHIRLE-STONE. *Trochites*.

The LONG WHIRLE. *Turbinites*. There are several of them. In one, the several Rounds are hollow: a ground to believe it was once a shell.

The WHIRLED or SPIRAL MARCHASITE.

The CONICK SNAIL-STONE. *Cochlites pyramidalis*. Very brittle, and maketh an *Effervescence* with any *Acid*.

Divers others SNAIL-STONES; some of them of a Limy substance, others perfect *Flint*.

The SEA-OYSTER-STONE. *Ostrites Cymbiformis*. Shaped almost in the figure of a *Boat*. In the right side especially there is as it were the signature or seat of the *Animal*. So that one can hardly doubt of its being once a shell. Yet this kind of *Stone* is sometimes found many miles from *Sea* or any great *River*.

A Petrify'd *Oyster* and *Wilk* growing together.

(b) Aldrov. Mus. Metall.

A great petrify'd SCALLOP. Figur'd by *Ambrosinus* (b) with the Name of *Hippopectinites*. Given with several more of the same bigness, by Mr. *Wicks*. 'Tis half a foot over. Many of the same kind were taken out of a great Rock in *Virginia*, forty miles from *Sea* or *River*.

The smaller PECTINITES, with smooth ridges.

ANOTHER, of a kind of Lead-colour. Dissoluble with *Acids*.

The Coralline PECTINITES, furrow'd, and wrought all over with the *Species* of fine Needle-WORK. Also soluble with *Acids*.

A blackish PECTINITES, a perfect *Flint*.

A soft Stone of a blewish grey, with part of the *Belemnites* growing to it on one side, and a *Pectinites* on the other.

A petrify'd COCLE immersed in a *Flint*.

The SMOOTH SPONDYLITES, with an Oblique Navle.

ANOTHER, with an Oblique Navle, all over striated.

A THIRD of the same, furrow'd.

A FOURTH, also furrow'd, and with the Navle sharper and more produced. So hard, as scarcely dissoluble with any *Acid*.

A FIFTH, with a strait Navle, and numerous Joynts.

The OXES HEART. *Bucardia*. So call'd from its figure. Described and figur'd by *Ferranti Imperato*, and others, and out of them by *Wormius*. 'Tis divided, by a ridge along the middle, into two halves. Each of them having a prominent Knob, a little winding, somewhat like a Navle: so that it may not be improperly called *Conchites umbilicatus*. Figur'd by *Besler* with the name of *Hysterapetra*.

A SMOOTH CONCHITES, with an Oblique Navle; unequal sides, somewhat round, and fill'd with a Limy substance.

Part of one, filled with a sort of granulated Spar.

A smooth and round one, undulated.

ANOTHER, as hard as a Pebble; of a yellowish and pellucid red.

Another hard one, yet dissoluble with *Acids*.

Another, with the Margins of the two halves furrow'd and indented one into the other.

A LONG CONCHITES, of a black colour.

Another, undulated, and white; filled with a black and yellow substance, which with *Acids* maketh a strong *Effervescence*.

ANOTHER, compressed, and the end opposite to the *Base*, pointed, like the common form of a Heart: and may therefore be called *Cardites*. 'Tis of a Limy substance dissoluble with *Acids*.

A Broad equilateral CONCHITES, radiated.

Another, undulated, and radiated.

A Third, undulated, radiated, and circinated.

A Broad one, of a Limy substance, and fill'd with a flaky and glistering Spar.

The HIGH-WAVED CONCHITES; that is, where the middle of one Valve making a high and broad ridge, the other falls into it. 'Tis of a white Limy substance.

ANOTHER of the same, but shining and pellucid like a Spar. Dissoluble with *Acids*. I meet not with any shell of this form.

A little BIVALVOUS MARCASITE. *Conchites Marchasita*.

The MUSCLE-STONE. *Musculites*. This is black and of an oblong Figure.

A Second, lesser and rounder.

Another of the same, more Concave.

A Third, broader, and more expanded.

A sort of MUSCULITES fill'd with Earth like *Tobacco-Pipe* Clay or Marle. Found amongst the earth of a Hill that was overturn'd at *Kenebank* in *New England*.

The square MUSCULITES. *Musc. quadrilaterus*. I have not yet met with any shell of answerable shape. 'Tis, as it were, bivalvous: and each Valve, hath two sides. Of the four, two are broader, and a little Convex, especially towards the *Base*, at the other end somewhat sharp: with oblique furrows, from the first to the last growing shorter. The other two, striated and plain, joyned with the former at obtuse Angles. Of a limy substance dissoluble with *Acids*.

The TOOTHLESS MUSCULE. Found, of several sizes, beded in a lump of *Irish Slate*: yet not petrify'd, but a perfect shell. It is of a rare kind, no where figured or mention'd, that I find, nor have I met with it elsewhere. The biggest of them two inches long, and $\frac{1}{2}$ over. That end near the *Base*, as it were pinched up, almost into the form of a Childs fore-Tooth. On the outside of the *Base*, stands a plated piece, contiguous therewith at both ends, but in the middle, joyned to it by the intervention of other very small transverse Plates, like the Wards of a Lock: supplying the use of the Teeth in other *Muscles*, which are here wanting; from whence I have nam'd it. The outside, is adorn'd with circinated Lines, and in some sort also radiated with very small *Tuberculi*, especially at the narrow end.

The

The SHEATH-STONE. *Solenites*. Like the petrify'd shell of the *Sheath-Fish*. 'Tis fill'd with a kind of limy substance.

A piece of WHIRLY-ROCK. *Turbinites Saxum*. A sort of *Gypsum* of a dark colour, with the semblance of divers kinds of turbinated or whirled shells immerfed therein. Dissoluble with *Spirit of Nitre*, but very slowly. There is one like to this in *Besler*.

A Piece of white MUSCLE-ROCK. *Musculites Saxum*. With the similitude of little, white, furrow'd *Muscle-shells*.

Another Piece of an Ash-colour, and more soft.

A piece of spotted MUSCLE-ROCK, *sc.* with white, red and brown, in imitation of Marble. In which also are beded, as it were, several *Muscle-shells*. Although it hath the face of Marble, yet is it a kind of *Gypsum*, dissoluble with *Spirit of Nitre*.

A Piece of MIXED SHELL-ROCK. *Conchites miscellaneus*. Composed of petrify'd shells, both of the Turbinated, and the Bivalvous kinds, beded in a kind of gritty Lime-Stone. In *Calceolarius's Musæum* (a) is one like to this, in the form of a *Chopping-Knife*, but without a Name. (a) Sect. 3. p. 317. Another in *Ferranti Imperato*. (b) And in *Aldrovandus's Musæum*, by *Ambrosinus* called *Ostracomorphos Lapis*. Not properly, *Lapis*, as being part of a *Rock*: nor, by the former word, sufficiently expressing the mixture of shells therein. (b) Lib. 24. c. 25.

Another, consisting of such like shells (or their resemblance) beded in a brown Stone.

CHAP. II.

Of VEGETABLE BODIES petrify'd, and other like STONES.

OF this kind, here is also great variety; being, or representing, Fruits, parts of Flowers, Leaves, Branches, Stalks, Trunks, and Roots: in which order I shall set them down. Only reserving *CORALS* with other like *Marine Productions*, to be spoken of by themselves.

A Petrify'd KATHERINE PEAR, or a Stone naturally very like one. Being, as that is sometimes, a little bended, very

M m slender

slender at the Stalk or Base; turbinated next the other end; umbellated at the top of all, or depressed round about the place of the flower; and of a yellowish tawny colour.

A STONE like a petrify'd DAMASCENE-PLUM. As that of a black colour, and of the same Figure; so far as to shew the seat both of the Stalk and Flower.

The Great petrify'd STONE of an exotick PLUM. As one would think, both from the figure of it, and the production of *Fibers* by the length, round about it, (as in many *Indian Plum-Stones*) very apparent especially, near the top. The granulated part of it, being turn'd to a soft opacous Stone; the *Fibers* into pellucid *Flint*.

A black Stone figur'd like the STONE of (a *Præcock-Plum*) an *Aprecock*.

(a) Mus. Metall. A petrify'd *NUX VOMICA*, sc. that of the Shops. As I call it from its figure exactly respondent; being round, and flat, on one side a little Concave, on the other somewhat Convex. In *Aldrovandus* (a) we have the Figure of a petrify'd *Nux Methel Officinorum*: but under the mistaken Title of *Castanites*. As also the exact figure of a petrify'd *Castanea Purgatrix*; but this too with the false Name of *Anacardites*. The same Author represents likewise a most exact figure of a petrify'd *Melopepon*.

A large JUDIAC STONE (*Lapis Judaicus*) in the form of a PEAR. 'Tis an inch and half long; stalked like a *Pear*; Next the stalk slender; turbinated upwards, to an inch in Diametre; and umbellated at the top, or depressed as a *Pear*, round about the flower. Adorned also round about with small tubercled *Striæ* which run from end to end. This *Species* not well figur'd by any Author.

ANOTHER of a somewhat like Figure, but much smaller. Best expressed by the least of the four in *Boe-*

(b) De Gem. & Lap. l. 2. c. 226. *tius*. (b)

A THIRD like an *ALMOND*; both of the same bigness, and shape, oval at one end, pointed at the other, and somewhat flat. *Besler* hath one or two like this, which he calls *Petrified Almonds*.

A FIFTH, like an *AKORNE*, being of a like thickness at both ends. Another of the same. This sort particularly called *Phoenecites*.

A SIXTH, like an *OLIVE-STONE*; being more oblong

long and oval than the precedent. *Besler* two or three *Stones* somewhat like this, which he calls *Petrify'd Olives*.

A SEVENTH, of a long slender Figure, and knobbed as the rest, almost like a *Hazel Catkin*.

An EIGHTH, in shape like a *Pestil*. The upper part of this is knobbed, the other smooth, whether naturally appears not.

These *Stones* either grow chiefly, or were first taken notice of in *Judea*; from whence their Name. They are commonly found, not in Earth, but in the Clefts of Rocks, by those that work in them. They are dissolved with *Spirit* of *Nitre*, not without *Effervescence*, especially when reduced to powder. And may therefore be justly esteemed *Diuretick*, and so sometimes bring away, or (as people think) break the *Stone*: for which, by *Pliny*, (a) 'tis call'd *Tecolithos*. (a) Lib. 37.
c. 10.

These *Stones* always break flaky, and with a strong gloss, like a *Spar*; or the *Entrochus* hereafter describ'd.

Of these *Stones* it is further observable, That being cut and polish'd *transversly*, and then wetted, they fairly exhibit, at least in colour, a twofold substance. The one, whitish; answering to the *Parhenchyma* or *Flesh* of a *Fruit*: the other black or dark-colour'd, not only in the *Stalk*, but also thence produced, and disposed into two *Rings*, a large one next the *Circumference*, and a small one in the centre of the *Stone*; answerable to the *Lignous Fibers*, distributed in much alike manner in some *Fruits*.

Two strait slender *Stones*, resembling the *COLUMNS* erected in the middle of some *FLOWERS*. One, *Convex* at the top, and almost flat. The other, spherically triangular, somewhat like the *Seed-Case* of a *Tulip*. Beneath, of an ash-colour; upward, of an obscure or brown Bay. Of that hardness, that if struck or let fall one upon another, they have a kind of *Metallick* sound, like that of small round *Button-Bells*.

Two other *joynted Stones* of the same nature with the former: looking as if they were pieces of the *GENICULATED STALK* of some *Plant*.

'Tis pleasant, especially with a *Glass*, to see the wrought *Work* on the surface of these *Stones*. In which the small and curious *Striæ* which run by the length, answer to the

(a) See the
Authors
Book Of
Trunks. And
that Of
Roots.

Lignous *Fibers*, or the warp: and those which are *transversely* as it were interwoven; to the *Parenchymous Fibers*, or Woofe of a Plant. A more particular explication of which real *Work* in all Plants, hath been by me elsewhere given. (a) *Calceolarius* hath one or two of these last fairly figur'd.

A Stone with the exact signature of a STEM of POLYPODY with the LEAVES. 'Tis softish, and somewhat brown. Stirreth not with *Acids*.

HIPPURITES. Or a Stone with the impressed Image or signature of the *Equisetum* or HORSETAIL. There are three stalks which very elegantly rise up from one Root.

DENDRITES. Or a *Flint* naturally adorned with the Images of several epitomiz'd or minute TREES. There is the figure of a fair one like to this in *Calceolarius's Museum*.

ANOTHER; being a SLATE about $\frac{1}{4}$ of an inch thick, representing, as it were, a plain Field, inclosed with a HEDGE of TREES; some bigger, others less; all so lively, as if it had been the curious and elaborate Work of a *Painter*; or had been cast through a Glasse (as *Kepler* shews the way sometimes of taking *Lanships*) upon a *Tablet* in a Dark Room.

(b) Aldrov.
Mus. Metall.

It is very observable, That the same curious Work which appears upon one side of the slate, doth also on the other. Agreeable to what *Ambrosinus* (b) also remarques, That if this sort of *Stones* be broken into several pieces, the like Work will appear in the intimate parts. Which plainly demonstrates, that not being superficial, it cannot be the effect of Art.

DENDROPOTAMITES. So I call it. 'Tis a piece of a kind of *Alabaster*, about seven or eight inches square, polish'd and set in a Frame. It hath much and pleasing variety both in colour and figure: shewing a mixture of brown, tawny, white, and green; and not unaptly resembling a couple of *Rivers*. One crooked or very much winding too and fro; (as the *Thames* at *Kingstone*) and garbed all along with *Trees* upon the Bank. The other strait, with a *Foot-walk* upon the Bank, and inclosed also with a little *Hedge-Row*.

A sort of ALABASTRITES, representing a *Transverse Section* of the TRUNK of a TREE. That part answering to

to the Wood, consisting of white and black Rings one within another. The other answering to the Barque, of two or three thin ones (like that of a *Cherry-Tree*) of a russet or barque colour. Yet the black Rings, being held up against the light, are transparent. So the clearest Glass, in some postures, appears black. *Spirit of Nitre* droped on it, dissolves it with a vehement *Effervescence*.

A Stone expressing part of a *Tranverse Section* of OLIVE-WOOD. On one side, 'tis very well polish'd. By means whereof, not only the *Annual Rings* (appearing in the Trunks of all Trees;) but also the *Insertions* or *Parenchymous Rays* which run betwixt the Pith and Barque; and even the greater Vessels themselves (either for *Aer* or *Sap*) are all to a good naked eye, but especially with the help of a Glass, very fairly visible. 'Tis just of the colour of the browner sort of *Olive-Wood* well varnish'd. 'Tis as hard as a *Jasper*, and seems to be of that kind.

ANOTHER sort of *Jasper* representing a piece of WOOD. 'Tis of a green colour, and stained with blackish spots. One would take it for a sort of *Lignum Vitæ*.

A Stone, which in Colour and Texture, seems to resemble a piece of *YEW-TREE*.

ANOTHER, which looks like a piece of *BEECH-WOOD*.

A large piece of PETRIFY'D WOOD (as it is supposed) above half a yard long, and $\frac{1}{2}$ of a yard about.

Another Piece about the same bigness.

A *Globular Stone*, which looks as if it had been a piece of *ASH-WOOD* turned in a *Lathe* into that figure. For it hath not only the colour, but the semblance of the *Annual Rings*, and of the *Aer-Vessels*, as in that Wood.

Small pieces of (reputed) petrify'd Wood, commonly found between the Beds of blew Marble. Two inches long, and near as thick as ones little Finger. Almost as black as *Ebony*.

A Piece of INCOMBUSTIBLE Wood, as it were HALF PETRIFY'D. For being held in the fire, it becomes red like a Coal; but neither flames, nor smoaks in the least.

A very odd Piece of the BRANCH of a TREE as thick as a *Cable-Rope*, whereof the Barque is turned into perfect Iron, or at least a very rich Iron Ore; and the Wood into Stone.

The

The petrify'd Barque of a Tree. 'Tis thin, and rowled up as *Cinamon*; but rather of the colour of that called *Winterane's*. Withall, rough and knobed without.

A Piece of *Oak* BARQUE cover'd with a stony Crust. Given by *Philip Packer* Esq;. From a Stump above Ground.

(a) Fossil.
Nomenclat.

In *Septalius's Musæum*, as I take it, is mention made of *Petrify'd Wood* found an hundred and forty *Pertches* under the top of a Mountain. And by *Kentman* (a) of a sort of petrify'd *Beech* (as the people call it) both Trunk, Branches, and Leaves, taken (for *Whetstones*) out of the Ground in the *Joachimick Vale*, an hundred and seventy Elns depth. But what kind of Eln is here meant, is not certain.

Of petrify'd Woods it may be noted, That none of them (at least of these here described) will make the least *Ebullition* with any *Acid*. Which would make one suspect, That they are *Stones* originally, *sui generis*; else it were strange, That some of them should not lie in places where such *Stones* are bred, which with *Acids* make the said *Ebullition*.

(b) De Lapid. Figur.
(c) De Lap. & Gem.
(d) Aldrov. Mus. Metall.
(e) Num. 100.

(f) Num. 129.

The STELENTROCHITE. By some, called *STELECHITES*: *Entrochites*, by most. But, in proper speaking, distinct from both. For it is not only of a *Cylindrical* Figure, or near it, and containeth a softer substance in the Centre, answerable to a Pith: and also radiated as the Branch of any Tree cut *transversely*. But moreover consisteth of several flat round Joynts like little Wheels, evenly pil'd, and, with the said *Rays*, mutually indented, so as altogether to make a *Cylinder*. Described also by *Gesner*, (b) *Boetius*, (c) *Ambrosinus*, (d) and others. But we have two Accounts hereof given us in the *Philosophical Transactions*, far more accurate and particular, than is elsewhere extant. The former, by Mr. *Lyster*; (e) together with between thirty and forty Figures of their Varieties, with some other Congenerous Stones. The latter, by Mr. *John Beaumont* (f) *Junior*; who hath added the Description of some more Diversities. And the manner of their growth. In this *Musæum* are several *Species*, which I shall here enumerate.

A ROUND one, near $\frac{1}{4}$ of an inch Diametre; with the Pith near a $\frac{1}{4}$, of a darker colour, hard and dense. The several

several Joynts, about the tenth of an inch thick; distinguished by slender Circles composed of very small knobs. With part of the Rock to which it grew, altogether irregular, but of the same substance.

ANOTHER, with a Pith larger and more soft, the Joynts thicker, and the Surface almost smooth.

A THIRD, of the same thickness, with the Pith $\frac{1}{2}$ an inch Diametre. 'Tis also a little bended; and the Joynts distinguished not with knobbed but entire Rings.

A FOURTH, with a Pith not much bigger than to admit a little *Pin*. Yet at one end 'tis $\frac{1}{2}$ an inch over. At the other somewhat more than $\frac{1}{3}$ d. A little bended as the former. And the Joynts in proportion to its width, extream thin; not above $\frac{1}{6}$ th of an inch. Their circumference, convex, being distinguished not with edged Rings, as the former, but with furrows.

A FIFTH, about $\frac{1}{4}$ of an inch over. The Pith answerable. The Joynts distinguished with edged Rings. And as thick as in the former.

A SIXTH of the same thickness. And a little crooked. The Joynts distinguish with furrows.

A SEVENTH, with the Joynts unequal both in breadth and thickness; one narrower and thinner, the next broader, or standing further out from the centre, and thicker, and so alternately: whereby it looks like some sort of Turn'd-Work.

An EIGHTH, a small one, yet finely shap'd. First with a Joynt embossed with a knobbed Ring. Next two small Joynts, each of them scarce thicker than a *Groat*; and so alternately.

A NINTH, not above $\frac{1}{8}$ th of an inch in Diametre; yet with Joynts as thick as in the fourth: and smooth.

A TENTH, $\frac{1}{8}$ th of an inch over, and with much thinner or more numerous Joynts.

An ELEVENTH, a very small one, scarce having any distinction of Joynts.

CORALLITES. As it may be call'd. With no Joynts, no Rays, nor Pith, but more like to a solid piece of *Coral*.

The ASTENROCHITE, or an *Entrochites* with a *Pentagonal Pith*, like the signature of a little *Asteria*, a Stone hereafter describ'd; from whence I have nam'd it.

ANO-

ANOTHER of the same. And also with a double Ring of Rays; so as to look like one of these Stones within another. And may therefore of all the kinds, be most properly called *ENTROCHITES*.

A FLAT ENTROCHITE. All the former are perfectly round: this compress'd; one way, an inch over; the other, about $\frac{1}{2}$ ^{ths}.

ANOTHER, a small one of the same shape.

A THIRD, not only flat, but also with two opposite edges, like the Scabbard of a *Rapier*.

The BRANCHED ENTROCHITE. Yet here the Branches, which grew alternately as Twigs on a Bough, are broken off. In one, leaving so many cavities in the *Trunk* on which they grew. In another, so many Knots. In both, radiated, and containing a *Pith*, as the *Trunk* it self.

The KNOTED ENTROCHITE. A very odd *Species*. Above two inches long, and $\frac{1}{2}$ in Diametre. The Surface smooth, yet with an obscure appearance of Joynts. The Knots, no way like those in the last mention'd, as not being radiated; and looking more like the bases of sturdy *Thornes*. Wherewith it not unaptly resembles a piece of a *Crab-Tree-Cudgel*. 'Tis composed of three distinct substances. The outer part, (as one would say, the *Barque*) is a flaky and glossy *Spar*, as in the rest. But as black almost as *Jet*. The middle part is *Ore of Marcasite*, or *Yellow Mundick*. The *Pith*, not unlike *Tobacco-Pipe-Clay*, when baked pretty hard.

A sort not much unlike these, being found in the Isle *Malta*, by some faith Mr. Ray, (a) are call'd *St. PAULS BATTOONS*.

(a) Phil.
Trans. N.
100.

The SYNTROCHITE, as we may name it, to distinguish it from the rest. It consists of several Joynts as the former; yet not piled evenly one over another so as to make a *Cylinder*: but slid as it were half on and half off.

The TROCHITES. 'Tis nothing else but one of the above described Joynts single; on both sides radiated, and also containing a *Pith*. So that it looks like a slice of a stick. These, faith Mr. Lyster, being usually hollow, or easily so made, and stringed, are therefore by some called *St. CUTHBERTS BEADS*.

The ASTROCHITES. As it were, the *Trochites* and the *Asteria* (hereafter described) together. That

There's one which may be called an *Entbrochite*, yet not a *Stelechite*, because Oval, or at least smaller at both ends; no way resembling a Stick or Branch. But there is no example hereof in this *Musæum*.

The True STELECHITES, branched. 'Tis not only radiated, and furnished with a Pith: but is one single piece without any Joynts or joynted Wheels: in which respect, it cannot be called *ENTROCHUS*; but very properly *Stelechites*, (from whence the *English* word *Stalk*) as more answerable to the *make* of a stick or stalk, than are any of the rest. 'Tis of an ash-colour, and curiously wrought all over in the like manner as a *Poppy-Seed*.

A Piece of a Rock consisting wholly of several *Species* of *ENTROCHI* or *Stelentrochi*, immersed in a bed of their Mother-Clay.

Another, with two or three small STELECHITES.

A hard Stone of the colour of a *Magnet*, with the signature of a *TROCHITES*.

These Stones being broken, look flaky, and with a gloss, as the *Lapis Judaicus*; but somewhat more obscure. They also make a like *Effervescence* with *Acids*, especially with *Spirit of Nitre*. And may probably be as good a *Diuretick*. That *All Fossiles* of what figure soever make an *Ebullition* with *Vinegar*, is affirmed by Mr. *Lyster*: (a) but was a slip of his, otherwise most accurate Pen. For there are many, and those of several figures, which, although powder'd, yet are so far from making any *Ebullition* with *Vinegar*, that neither *Oil of Vitriol*, nor *Spirit of Nitre* it self, (which taketh place sometimes where the former doth not) will stir them: as appears in several Instances in this Catalogue.

Phil. Trans.
N. 100.

They are found in as great variety here in *England*, as in any other Country. By Mr. *Lyster*, in certain *Scarrs* in *Braughton* and *Stock*, two little *Villages* in *Craven*: in some places of the Rock as hard as *Marble*. In such plenty, that there are whole Beds of Rock made of them. By Mr. *Beaumont*, in *Mundip-Hills*; in the Rocks, from the Grass to twenty fathome: but most in Beds of a grey and gristy Clay. In a *Grotto*, five and thirty fathome deep, he observed their growth: which was, from the finest, and the softest of the Clay. At first, they were whitish, soft, and smooth.

N n

After

Afterwards, grew hard, and ridged, or divided into *Trochi* or Joynts; beginning at the top, and so descending. Being all the while in a manner quicken'd with Mineral Steams; conveyed, from the Mother-Bed, through the Pith of the several Feet of the Root (which Mr. *Lyster* figures) and of the Stock it self.

It were also further worth the enquiry, In what Time, one of these *Stones* will grow up. Whether it doth so, by *Starts*, as *Ice* often doth, and as I have seen a little *Icy-Tree* to grow level upon a Table? And whether so much as serves for the making of a single Joynt, at every *start*?

A *Stone* figur'd like a Piece of *ANGELICA* Root; with a large *Pith*, and very distinct *Rays*, as the *Cortical Insertions* in that, or other like Root round about.

TWO lesser round ones or more *Cylindrical*: one resembling the Root of *CICHORY*; the other of *TORMENTILE*.

A *STONE* somewhat *FLAT*, like the Root of *Iris*: but radiated as the former. More visible, if one end, being first polished, be then made wet; for so, both the *Pith* and *Radiation* are very distinct.

A *FOURTH*, as it were bared of the Rind; and having one end with a kind of *Button*, on which the *Rays* wind toward the Centre; as the Lines of a Rumb upon a Map, or the Suits of the Attire of any *Corymbiferous* Flower.

All these seem to be several stumps of Stone Roots, on which the above described Stones often grow.

A *FIFTH*, with a *Pith* and *Rays*; but *CONICK* and *CROOKED*, not unlike the young bud of a *Horn* of a *Calf*.

TWO more of the same Figure, but much less; rather resembling a *COCKS SPUR*.

Several *CLUSTERS* (as they appear) of petrify'd *MOSSE*. *Imperatus*, with *Dioscorides*, makes it a sort of *Alcyonium*.

A petrify'd *TUBER*, with several small papillary knobs, not much unlike that called *CERVI BOLETUS*. It stirs not with any *Acid*.

CHAP. III.

Of CORALS, and other like MARINE Productions.

THEse having also a resemblance unto Plants, and a near analogy unto those Stones, last described in the precedent Chapter; they may therefore not unaptly be here subjoyn'd.

A Piece of CORAL, smooth, white, and solid; with its Base or Root spread abroad upon a *Chalky Bed*.

A SPRIG of solid *Red Coral*.

A knoted TRUNK of the same $\frac{1}{2}$ inches and $\frac{1}{2}$ in compass.

A Piece of solid CORAL both RED and WHITE, growing together.

The ROOT of a solid Red CORAL, spread upon the TRUNK of a White CORAL: in the same manner, as the Membranous Roots of *Sea-Shrubs* are spread upon Stones or other steady Bodies. As if it had been indeed originally one of those *Shrubs*; particularly, of the Lignous kind, which hath no *Pith*, like the Horny; but, as this *Coral*, is altogether solid.

The SHRUB-CORAL. *Corallium fruticosum*. So I call it, for its more especial similitude to a little *Shrub*. 'Tis of a brownish colour, upright, and very much branched. Curiously adorned round about with *Striæ* running by the length; looking like the superficial *Fibers* in the stalks of some Plants. And within, radiated, as the same when cut *transversely*. In some of the greater Branches, the *Rays* being pointed or pricked, as by the laxer distribution of the *Fibers*, they are in some Plants. And many of them coming short of the Centre, so as also to form a kind of *Pith*.

The KNEED CORAL. *Corallium geniculatum*. *Pseudocorallium fungosum Ambrosini*. (a) *Madrepora ramosa Imperati*. (b) By which Name *Bauhinus* also describes it well. 'Tis striated without, and radiated within, almost as in the precedent. And is also ringed or knoted without, after the manner of *Canes*, or rather the upright *Equisetum*, and near of the same thickness. *Imperatus* hath another kind a kin to this, yet distinct; not only knoted, but joynted, and by him therefore called *CORALO Articulato*, in which

(a) Aldrov.
Mus. Metall.
(b) Lib. 27.
Cap. 4.

the Conick end of one Joynt is received into the like Cavity of another.

A Piece of the same CORAL found on *St. Vincents* Rock.

(a) Mus.
Septal.

The *Matripora*, saith *Terzagi*, (a) and all Pores (as he calls them) and these only, are outwardly rough with *transverse* Wrinkles. But this now describ'd, seems by the *Striae* more apparently wrinkl'd by the length. So that what he means, I do not well understand.

A JOYNT of the shallow joynted CORAL. 'Tis near an inch in Diametre, two and $\frac{1}{2}$ long, solid, heavy and white. Streaked by the length. The two ends a little thicker, as of Bones at the Joynts: and rising up from the Rim to the Centre into a little knob; and this it doth at both ends: whereas in that of *Imperatus*, the Joynts are deeper, and one end hollow. It was given by Sig^r. *Boccone*.

A Piece of white FIBROUS or striated CORAL, but not knoted. Given by the same Hand.

The BUBL'D CORAL. *Corallium bullosum*. From the same hand. 'Tis of an ash-colour; and rough cast all over, with very small Blisters or Bubbles.

The COOME-CORAL. *Corallium cancellatum*. 'Tis white, and divided into several short and thickish Branches, turbinated or knobbed at the top. Wrought all over with small cancellated Work, like that of an *Honey-Comb*, or the inside of that Ventricle in a *Sheep* or a *Cow*, called the *RETICULUM*.

The FLORID COOME-CORAL. The Branches of this also are short; and numerously flourished. Inwardly, white and porous. The Surface of a pale yellow, and wrought, as the former, in imitation of an *Honey-Coom*.

A sprig of Rough and POROUS Red Coral.

The PUMIS CORAL. *Corallium pumicosum*. From the Person above-said. 'Tis branched, of a grey colour, and porous, somewhat like a *Pumis Stone*.

The POUNCED CORAL. *Corallium punctatum*. 'Tis white, and the Surface pricked full of small holes, almost as in the precedent.

(b) Lib.
G.

The BRANCHING POUNCED CORAL. It seems to be that described in *Baughinus* (b) with the Title of *Corallium asperum caudicans adulterinum*. The Branches hereof

hereof are very broad, and divided only at the top. Not only porous within, but also pricked full of extream small holes on the outside.

The STOOPING POUNCED CORAL. *C. punct. procumbens. Porus Ramosus Bauhino.* In this, some of the Branches rise up obliquely, and distinct. Others of them, trail or stoop, and are in several places inosculed.

The RUSSET POUNCED CORAL. This is also branched; and the Root hereof, as that of a *Sea-Shrub*, spread upon an *Oystershell*.

The WARTED CORAL. This likewise is a sort of pounced and branched *Coral*; and white. The Branches being also as it were warted or knobbed. (a)

(a) Imperatus, Lib. 27.

c. 4.

ANOTHER of the same; MORE branched.

The White STARRY CORAL. From the Person before nam'd. Described and figur'd by *Imperatus*. So called, because it is perforated with round and radiated Holes resembling little Stars.

The Brown STARRY CORAL. Within, a little whitish. Not so porous, as the precedent; and with nothing near so many Stars. The Branches flat, like the Horns of an *Elk*; and spread abroad.

The OCULAR CORAL. *C. alb. oculatum Officinarum.* Very well describ'd and figur'd by *Ferranti Imper.* (b) and (b) Lib. 27. *J. Bauhinus.* (c) This sort is fistular, and hath large round (c) Lib. holes in the sides of the Branches, sometimes near $\frac{1}{2}$ of an c. inch over; somewhat like a *Birds Eye*.

A Piece of the same sort, with its expanded Root.

The same growing on or round about some of the Branches of a *Sea-Shrub*. As it is probable, That all the sorts of fistular *Corals* once did.

The CROWNED OCULAR CORAL. Given by Sir *J. Hoskins*. In this, which is also white, to the eyes on the sides, are added little Heads crowned or radiated round about.

A CLUSTER of Red Fistular *Coral*.

The spread FOLIATED CORAL. *Clusius* describes it by the Name of *Planta Saxea Abrotonoides*. Of whom *Bauhinus* borrows his figure. His Description not clear. 'Tis white, and porous; especially the centre of every Branch, in imitation of a Pith. The several Branches encompassed

encompassed with little short round hollow sprigs, or, as we may call them, *Coral-Leaves*, curiously striated round about.

The Upright FOLIATED CORAL. In all respects like the former, saving that it is less spread.

Coral is fish'd for from the beginning of *April* to the end of *July*. Not in the *Ocean*, but the *Mediterranean-Sea* only. In which there are eight or nine Fisheries, among the *Rocks*, no where above forty miles from *Land*. Three upon the Coast of *Sardinia*; on that of *France*, two; of *Sicily*, *Catalonia*, *Corfica*, and *Majorque*, one. (a) Of white *Coral*, there is great abundance in *Brasile*. (b)

(a) Tavern.
Ind. Voyage,
Chap. 21.
(b) J. de
Laet.
(c) Of the
Orig. of
Forms, 136.
(d) Mus.
Rom. p. 45.
Col. 2.

Of the Nature and Generation of *Coral*, it is affirmed by the Honourable Mr. Boyle, (c) That whilst it grows, it is often found soft and succulent, and propogates it *Species*. And by Georg. de Sepibus, (d) That of those who had been us'd for many years, to dive for *Coral* in the *Red-Sea*, Kircher learned thus much; That it would sometimes let fall a *Spermatick Juyce*, which lighting upon any (steady) Body, would thereupon produce another *Coral*. And further, by Wormius and Tavernere, from the Relations of others, That this Juyce is white or milky. Which may seem the more credible, when we consider, that the like milky substance is found in divers Mines. (e) Sometimes inclosed as is observed by Mr. George Planton, in great Hollows of the *Metallick Rock*. (f) And that Mr. Beamont hath found in the Hollows of some Stones called *Entrochi*, and *Rock-Plants*, or a kin to them, an evident concretion of such milky Juyce. (g)

(e) Dr.
Brown's
Trav.
(f) Phil.
Transf. N.
100.

(g) Phil.
Transf. N.
129. p. 730.
l. pen.

Of *Corals*, are chiefly prepar'd, The Powder ground upon a *Marble*; the *Magisterial Salt*; and the *Tincture*. To good purpose, in some *Feavers*, and some other Cases. But the Name of *Tincture*, according to the common notion of it, is a meer deceit: it being, in truth, no more but a *Liquamen*, or solution of the *Magisterial Salt*. For those *Acid Liquors* which are used as *Menstruums* for the making of it; by digestion or repeated heats, do always turn red: which not being heeded, the said colour hath been believed to proceed from the *Corals*. Of the Effect of this *Tincture*, or rather *Salt of Coral*, upon a *Malignant Feaver*, see a Memorable Relation of Boetius in his own Case. (h)

(h) De Lap.
& G. lib. 2.
s. 154. p. 312.

BASTARD

BASTARD-CORAL. *Alcyonium*. So call'd, because a *Marine* Production, often of a roundish form, like the Nest of an *Halcyon*, and by some phantastick thought to be one of those Nests petrify'd. Hereof there are seven or eight sorts here preserv'd. As

The Great, White, FISTULAR *Alcyonium*. *Imperatus* figures a Cluster of this under the ill Name of *Vermi Marini Impetrati*. (a) And *Besler* a single crooked Tube, (a) Lib. 24. cap. 26. with that of *Exuviae Serpentis in Lapidem conversæ*; which is as bad. This is such an one, but more strait and smooth, as thick as the upper end of a *Tobacco-Pipe* stalk. But with a much greater bore.

The Middle white FISTULAR *Alcyonium*. A Cluster of *Coralline Tubes*, in some places, meeting in parcels; in others, divaricated, almost as the Vessels do in Plants. Not equally thick at both ends; beneath, not exceeding the Quill of a *Crow*; at the top, as wide as that of a *Goose*. Rough all along with annular wrinkles, almost like the slough of a *Silk-Worm*, or a *Serpent*. Being hollow, 'tis probable they serve as the *Matrices* of some *Sea-Insects*.

The small white FISTULAR *Alcyonium*. By *Imperatus* (b) (whom *Terzagi* imitates (c)) called *Vermicchiara*; (b) Lib. 27. cap. 8. and *Alcyonio Milesio*; a much better Name. A Cluster of (c) Sept. Mus. c. 13. n. 18, 19. crooked Tubes, not thicker than a *Packthread*; and also wrinkled.

The Red FISTULAR *Alcyonium*. By *Imperatus* call'd *Tubularia purpurea*. By *Besler* *Alcyonium Maris Rubri*. A Congeries of strait, and red Pipes, of a *Coralline* substance, about as thick as an *Oaten* straw, all standing parallel, as the Cells in a *Honey-Comb*: and divided into several Stories by transverse Plates or Floors, at several distances from a $\frac{1}{4}$ to $\frac{3}{4}$ an inch, or thereabout.

The BRANCHED *Alcyonium*. 'Tis white, and of a *Coralline* substance, but somewhat soft. The Branches solid, and in some places *coalescent*.

The KNOBED *Alcyonium*. Of a white and coralline substance, but somewhat soft. Of such a Contexture, whereby it is every way, and pretty openly, pervious throughout; somewhat answerable to that of a *Sponge*. Evenly tuberculated all over the top and sides.

Another, unequally tuberous, and of a little more open compages. The

The LÖBED *Alcyonium*. Of a like colour and substance with the former: yet not composed of round, but flat or lobed portions, with some likeness to *Liverwort*.

The BUBLED *Alcyon*. Given by Captain *Th. Fissenden*. About $\frac{1}{2}$ an Eln in compass. Consisting wholly of *Plate-work*, so conjoyn'd, as to make several large *Apertures*, running one into another: somewhat after the manner of a *Ruff*. The Plates or whole Body compos'd of most minute Bubbles, divided by a very thin Sepiment, and standing all in even, strait, and parallel Rows. So that it looks not much unlike Linnen-Cloath: saving its brown tawny colour.

A NETED *Alcyon*. *Retepora Imperat*. So called from its Figure.

MUSHROON-CORAL. *Fungites*. So called from a little likeness it hath to a *Toad-Stool*. Here are divers sorts.

The WAVED *Mushroon Coral*. 'Tis round, and above two inches over; striated beneath round about. The *Rim* and *Area*, both undulated. With thin Plates standing all along, and on both sides *transversely* to the Waves.

ANOTHER, with DOUBLE WAVES. Circular, and about four inches in Diametre. With the top rising high and round. With transverse *Striæ*, rather than Plates. And Waves both double, and more winding than in the former; much resembling those of a Mans Brain. From whence, this sort, most properly, are called *BRAIN-STONES*.

A POLISH'D *BRAIN-STONE*. It much resembles a sort of undulated Stone. Whereof hereafter.

Part of a large *BRAIN-STONE* from the *Bermudas*.

The PLATED *FUNGITES*. So especially to be called, because it hath no *Undulations*, but Plates only. All very thin and sharp, and radiated, to the circumference, after the manner of those in a common *Mushroon*; excepting, that there they stand underneath, here above. This sort is curiously figur'd in *Calceolarius's Museum*.

A FLAT RADIATED *Fungites*. Figur'd by *Bauhinus*.
 (a) Lib. 39. (a) 'Tis somewhat more than two inches broad, and with the
 c. 60. sides as it were crushed together. Waved round about, and the *Rim* raised like a border pretty high.

A STARRY *FUNGITES*. Of a circular figure; beneath, a little concave; above, convex. Wrought all over with a great number of small radiated Stars, every where contiguous. A

A Piece of *Fungites* with GREAT STAR-WORK: every Star, with the Rays, being near $\frac{1}{2}$ an inch over; and the Rays also plated.

The COOMED *Fungites*. The top hereof is circular; all over carved into radiated *Tubes*, the *Rays* standing high without, and deep within. Composed together so, as somewhat to resemble an *Honey-Coom*, from whence I name it.

ANOTHER of the same sort, of an Oval Figure. Given by Sir R. Moray.

A Fragment of a great One of the same sort. In which the Texture is fairly observable. For the aforesaid *Rays*, are indeed the extremities of so many Plates which run through the length of every *Tube*; and which are likeways all the way conjoyned with an infinite number of other extream small thin transverse Plates: dividing the whole *Tube* into little squares, after the like manner, as in the Pith of a *Bull-rush*.

The *Fungites* is found in the *Indian-Sea*, and the River *Nilus*. (a)

(a) Clusius.

CHAP. IV.

Of GEMS.

A ROCK of DIAMONDS. Given by Sir R. Moray. They grow upon their Bed (which is about three inches broad, and four in length) in *Crystals* Sexangularly pointed. Of several sizes from the thickness of a midling Pin, to a $\frac{1}{4}$ of an inch Diameter, but all of them short. Not very perspicuous, but a little greyish, like the *Calcedony*. Saving one small cluster of them, tinctur'd yellowish. They cut Glas very deep and easily.

The principal Diamond Mines now known, are four. That of *Raolconda*, in the Kingdom of *Visapour*; discover'd 200 years since. In this Mine, the Diamonds lie in sandy Veins in the Rocks. Of all, the *clearest*, and of the whitest *Water*. They pound and wash the Vein for the *Diamonds*, just as we do some of our *Ores* for the Metal. A second

O o

call'd

call'd the *Gany*, about seven days journey from *Golconda*; found out 100 years since. They dig here not above 14 feet deep. Sometimes above sixty thousand Men, Women and Children at work. It affords the largest *Diamonds*, but not clear: one sometimes above 40 *Carats*, i.e. $\frac{1}{3}$ ^d of an ounce. And there was one here found which weighed 900 *Carats* (i. e. 3vij ff.) A Third, that of *Govel*, a River in the Kingdom of *Bengala*. The *Diamonds* are found in the sand of the River, for the space of 50 Leagues. From hence come those fair pointed Stones called *Natural Points*: but not great. The Fourth, that of *Succadan*, a River in *Borneo*. But there are none come from thence but by stealth. How the *Indians* prove, work, and sell their Stones, with

(a) Ind. Tav.
lib. 2. c. 11,
12, 13, 14,
15.

(b) Mr. Boyle
Of Gems,
p. 11.

(c) Joh. de
Laet L. de G.
& Lap.

(d) Boet. de
Lap. & G.

(e) Lib. 1.
c. 43.

(f) Of Gems,
p. 109.

(g) Ib. p. 112.

other particulars, see in *Tavernere*. (a)

Rough *Diamonds* are often naturally figur'd into Triangular Plains: a mark to know a right one by, (b) as well as hardness. Many also of the best are pointed with six Angles; some, with eight; and some Tabulated, or Plain, and Square. (c) *Diamonds* receive no hurt, but are rather mended, by the fire. (d) Some, saith *Garcias*, (e) being rub'd, will take up straws, as *Amber* and other Electrical Bodies. And Mr. *Boyl* (f) speaks of one of his, which with a little friction attracts vigorously. Of another, (g) which by water made a little more than luke-warm, he could bring to shine in the dark.

(h) Boet. de
G.

'Tis the property of all true *Diamonds*, To unite the *Foyle* closely and equally to it self, (h) and thereby better augment its lustre, than any other *Gem*. That which is called the *Foyle*, is a mixture of *Mastick* and burnt *Ivory*: The latter, being one of the blackest of colours; used by *Painters* for *Velvet*, the *Pupil* of the Eye, &c.

(i) Mr. Boyl,
Of Gems,
p. 51.

(k) Ib. p. 35.

The Water of those which are drawn, not from the Rock, but the Ground, commonly partakes of the colour of that Soil or Ground: (i) and some are found as yellow as a *Topaz*. (k)

Between the Grain and the Vein of a *Diamond*, there is this difference, That the former furthers; the latter, being so insuperably hard, hinders the splitting of it. Although it seems, that a Vein, sometimes is nothing else, but a Cross-Grain. Our *European* Jewelers, when they split one, they take a very small iron Wyre, and having daubed it with

with Oil and Powder of *Diamonds*; draw it upon the *Diamond*, by a Tool, to and fro like a *Saw*, so long as is needful for that purpose.

The **BASTARD-DIAMOND**. *Pseudo-adamas*. Now remaining, as it was found, bred in a *Musculites*, a Stone like a *Musclebell*. Given also by Sir *Robert Moray*. 'Tis angular, pointed, and very clear. And cuts *Glass* with great ease and depth. Of our *Bastard-Diamonds* here in *England*, the *Cornish* are the best; much better than those on *St. Vincents Rock* near *Bristol*.

CRYSTAL. From $\kappa\rho\upsilon\varsigma$ & $\pi\lambda\omega$: because supposed to be only *Water* contracted or condensed with cold. Here are several sorts.

A **CRYSTAL ROCK**. In which, several lesser *Crystals* Sexangular, pointed, and most perspicuous, grow round about a great one, in the form of a *Pyramid*, above eight inches about. The bottom of it being polish'd, all the sides to the top, are very pleasantly apparent through the same.

A small **COLUMN** of *Crystal*, also exceeding clear.

A **ROCK** of midling *Crystals*, growing upon a Semiperspicuous *Bed*, or *Grey-Mother*. They are very clear, notwithstanding that beneath they seem to be tinctur'd yellow; being there only daubed with some substance of a yellow colour. Of these *Crystals*, the two opposite sides, are the greatest: which is also observable in many others.

A small *Crystal* **COLUMN**, with a whitish *Base*.

ANOTHER clear *Crystal*, growing on a Semiperspicuous *Mother*, together with a kind of *Marchasite Spar*, or tessellated Stone, of an *Amethystine* colour.

A **ROCK** of small *Grey Crystals*, almost like a *Calcedony*.

Another of the same sort, growing upon a kind of *Limestone*.

A Third, with the Points of an *Amethystine* colour, growing to a *Matrix* of a purplish black.

A *Crystal* **COLUMN**, of an *Hyacinthine* colour, but dilute. An inch in *Diameter*, and almost $\frac{1}{2}$ a foot long. The two opposite sides of this also are the greatest.

A lesser one of the same *Species*.

A THIRD, growing upon a Bed of the same colour; but opacous. Mr. Boyle (a) mentions a piece of *Crystal*, in one part of an *Emerald-green*. And Terzagi (b) another that was black.

(a) Of Gems,
P. 39.
(b) Mus.
Sept.

A *Crystal* COLUMN, naturally inclosing a kind of Moss (or the likeness of it) at one end of the Column of a paler, at the other of a dark Green. 'Tis above $\frac{1}{2}$ a foot in compass.

ANOTHER piece of *CRYSTAL* in which is immerfed a Mossy substance of a redish colour. And there are some *Crystals* have been known naturally to enclose a Li-
quor. (c)

(c) Mr. Boyle,
Of Gems,
P. 43. &
Mus. Calc.

A Piece of polish'd *CRYSTAL* in the figure of a half *Globe*. 'Tis on one side flaky, and hath many very small *Bubbles*, by which it appears cloudy.

ANOTHER Piece polish'd into a Sphærical Triangle, and somewhat Oval.

A THIRD Piece polish'd into a *Cone*.

A Massy Piece of *CRYSTAL*. Not pointed, nor angular; but of a roundish figure; much bigger than any mans head. One way, near a yard in compass; the other, above three quarters. In weight, thirty nine pounds and a $\frac{1}{4}$ *Haverdupoise*. Yet is it very clear, beyond the clearest *Ice* of the same thickness. The biggest piece of *Crystal* I find mention'd else-where, is a Ball of six and thirty ounces in *Septalius's Musæum*.

(d) Lib. 2.
c. 73. l. 1.

(e) Mus. Sep-
tal. c. 9. n. 54.

Crystal, at least some sorts of it, is the softest, saith *Boetius*, (d) of all *Gems*. He should have said, of all perspicuous *Gems*: for the *Turcois* is much softer. The most usual Figure of *Crystal*, is *Sexangular*: yet Terzagi (e) mentions a Rock of square pointed ones. But it is observable, That he saith the Bed on which they grew, seem'd to be *Gold-Ore*. If so, it might proceed from some governing principle in the *Ore*. For I have heard it noted, as I remember, by Sir *Christopher Wren*, That *Grain-Gold* is often found naturally figur'd into *Cubes*. *Crystal* grows in most Countries, both cold and hot: the *Globous*, especially in *Bohemia* and *Silecia*.

(f) Boet. de
Gem. & L.
Lib. 2. c. 74.

(g) Ib.
(h) Terzagi
in Mus. Sept.

A Drachm (f) of the Powder of *Crystal*, with Oil of sweet *Almonds*, a present Remedy for those that have taken sublimite. As also for *bilious* and *chylous Diarrhæas*. (g) When *Calcin'd*, by some called *Pulvis Cæsaris*, of excellent use against the *Epilepsie*. (h) An

AN AMETHYSTINE ROCK. The *Gem* hath its Name from the opinion of its being an *Amulet* against Drunkenness. This *Rock* consisteth of angular pointed and contiguous *Crystals*; growing from both sides the *Matrix*, inwards, where their Points meet, and are all closely indented. Some of them seem to be *Pentagonal*. Several are *Conick* from the Points towards the Roots. These are well tinctur'd, but the Roots are all white, or rather *Diaphanous* and colourless. As also is the *Matrix*, or inward part of it; yet not so clear. The shell over all, flat, opacous, and of a redish brown. There is the Figure of a very fair one in *Calceolarius's Mus.*

ANOTHER, growing upon a *Matrix* or Bed spotted red and yellow, and cross-grain'd, or compos'd of small *Crystals* set together *decussatim*.

A THIRD, the *Matrix* whereof is a kind of *Amethystine Flint*, i. e. not compos'd of *Crystals* or *Grains*, as is usual, but one entire massy Stone, Semiperspicuous, and of a pale blew, almost of the colour of some *Cows Horns*. Of an orbicular Figure, and somewhat flat like a *Loaf*. The Roots of the *Crystals* are colourless, as in the former, and the points and upper parts of a pale *Purple*. With these, is included in the same *Matrix*, a whitish and flaky Stone, which is easily dissolved with *Spirit of Nitre*. Which is one, amongst many instances, how near together two Stones may be bred, of so different a nature one from another.

A WHITE AMETHYST. This is here naked, or without a *Matrix*. Consisteth of divers contiguous *Crystals*, half an inch and an inch long; their Roots grey; but their Points clear, usually sexangular. From the Points the Roots taper'd or conick: the Figure which doth especially distinguish this Stone from *Crystal*, whether white, or of an *Amethystine* colour.

AN AMETHYST of a pale Violet colour; found growing in *Scotland*. Given by Sir *Rob. Moray*.

ANOTHER, with a kind of *Chrysolite* growing to it.

The best of this kind, are, as *Theophrastus* well describes them, of the colour of a ripe (red) *Grape*: and are the hardest. These grow in the *Indies*: the rest in *Bohemia*, ^{(a) Boet. de} *Saxony*, &c. The best, being burnt, excellently imitate a ^{Gem. &} *Diamond*. ^{Laps} (a)

Two

Two little white or pale SAPHIRES, polish'd into a flat oval Figure. By some called *The Female*: and so the paler kinds of other *Gems*. The best, grow in *Bisnagar*, *Zeilan*, and other parts of the *East-Indies*, especially in *Pegu*. The meaner, in *Bohemia*, and other adjacent places. They are cut or fashion'd with *Emery* and *Tripoly*; and engraven with *Diamond-Dust*, as other harder *Gems*. Being

(a) Boet. de
Gem. & L.

burnt, they imitate a *Diamond*, as doth the *Amethyst*. (a) And *Æs ustum* and *Glass* melted together, imitate a *Sa-*

(b) Aldrov.
Mus. Metall.

phire. (b)

(c) Lib. 2.
c. 43.

The *Sapphire*, saith *Boetius*, (c) being applied to any bruised part, prohibits the Inflammation of it, in a miraculous manner. See also the *Salt* and *Tincture* (d) of it described and commended by the same Author.

(d) Ibid.

The GRANATE, *qu. Ingranate*, or *Ingraind*. And therefore by the *French* called *VERMEILLE*: and the *Matrix*, by *Moscado*, *Minera de Ingranata*. The deepest, well compared by *Imperatus* to the Juyce of a ripe *Mulberry*. Here are of several sizes.

A BOHEMICK GRANATE, as big as a *Nutmeg*. With several more of the same size, or near it.

Some other Large GRANATES, polish'd with *Rhombs*. But these are cloudy.

A Bag of Lesser GRANATES, of several sizes from a *Pease* to a *Mustard-Seed*.

A BED of GRANATES from the *West-Indies*. Given by the Honourable *Rob. Boyle Esq.* Most of them as big as a large *Pease*, beded in a Stone which is friable, and easily rub'd to a redish and glistering powder; in some places a little black, and growing with cross Flakes. It seemeth, from its softness, not to have been the original *Bed* or *Matrix* wherein the Stones were bred; but that being, in pecking the *Rock* or *Mine*, broken off from that, they were afterwards casually lodged in this.

These Stones grow in *Calecut*, *Cambaia*, and *Æthyopia*. As also in *Spain* and *Bohemia*, where, contrary to what is

(e) Boet. de
Gem. & L.

observed of most other *Gems*, they are found exceeding the *Oriental*. (e) Many of them will abide the fire, without change of colour. (f)

(f) De Laet.
de Gem. &
L.

(g) Mr. Boyle,
Of Gems,
p. 88.

Spirit of *Salt* extracts a rich *Tincture* out of *Granates* calcin'd and finely powder'd. (g) And *Aq. Regis*, a rich solu-

solution of them, only powder'd; colour'd somewhat like a solution of Gold. (a)

(b) Ibid.

The Jewelers TOPAZ. *Chryseleſtron Plinij.* This is an Oriental one. 'Tis of a perspicuous Golden colour, with some scarlet spots or like a deep Tincture of *Saffron*.

The Whiter or Female TOPAZ. Composed of several *Crystals*, clear and colourless at the top; below, clear and yellow. Growing on a white *Matrix*, with a light yellowish Tincture. They grow in *Arabia, Bohemia, &c.* The best in *India* and *Bactriana*: the *Europeans*, especially, being soft, and not without blackish Clouds. The *Oriental*, the hardest of *Gems*, except the *Diamond*. And probably the *Ruby*.

Found sometimes so big as to weigh twelve pounds. (b) *Æs uſtum, ſtannum uſtum, Cinabar, and Crystal*, melted together, imitate a *Topaz*. (c)

(b) Boet. de Gem. & L.

(c) Aldrov. M. Metall.

The SMARAGDUS, growing together with a pale *Ame-thyſt* in one *Matrix*. The *Crystals* are angular, but seem to hold no proportion.

The *Occidental*, sometimes as big as a mans fist, especially in *Peru*; but soft and cloudy. The *Oriental*, no bigger than a *Filbert*. The *Europeans*, in *Cyprus, &c.* the worst. 'Tis imitated (d) with *Æs uſtum*, and half as much *Crocus Martis*.

(d) Ambroſin. (in Aldrov. M.

Six Grains of this Stone, in powder, procureth ſweat. (e) Applied entire to the Belly, ſtopeth all kind of *Dyſentries* in a miraculous manner. (f)

Met.) out of Porta.

(e) Muſ. Wormian.

(f) Boet. from Guai-nerius.

A CLEAR and GREEN STONE, (a kind of *Smaragdus*) which, being heated red hot, shineth in the dark for a conſiderable time, ſc. about $\frac{1}{6}$ th of an hour. Given by *Dr. William Crown*. I tried the experiment my ſelf alſo. And at the ſame time obſerv'd, That as it grew hot in the fire, its Green colour was changed into a Sky-blew; which it likewiſe retain'd ſo long as it continu'd to ſhine: but after that, recover'd its native green again.

The AGATE. So called from the River *Achates* in *Sicily*, near which it was firſt found. (g) Almost of the colour of clear *Horn*. The hardest of *Semiperspicuous Gems*. They grow in *India, Germany, Bohemia*. Naturally adorned with much variety of waved and other figur'd Veins, Spots, the representation of Vegetable, and sometimes of Animal Bodies. None more memorable, than that mention'd

(g) Theophr. de Lap.

by

(a) Lib. 7.
c. 11.

(b) Mus.
Septal.

by *Pliny*, (a) of *Pyrrhus* King of *Epyrus*, in which, without much strain of phancy, one might imagine a representation of the Nine *Muses*, and *Apollo*, with his *Harp*, in the middle of them. 'Tis used for *Sword-Hilts*, *Knife-Hafts*, *Beads*, *Cups*, and the like. There are pieces of it, sometimes (b) as thick as a Mans Arm.

The *ONYX*. So called, because in colour not unlike the Nail of a Mans Finger. *Ambrosinus* confounds the *Agate* and the *Onyx* together. But the *Onyx* differs from the *Agate*, chiefly, in that, instead of *Veins*, 'tis generally composed, saith *Boetius*, of *Zones*. But I think rather of several *Balls*, one within another: which, when the Stone is polish'd, do indeed represent a round spot in the centre, with several *Zones* or *Rings* about it. Here are of divers sorts.

An *ONYX* with a white, and very broad *Zone*.

ANOTHER, of a pale Blew.

A THIRD, with *Rings* White and Bay.

A FOURTH, of a light yellowish colour, or of *Citrine Amber*, with ash-colour'd *Rings*.

A FIFTH, in Figure like an Eye, with the *Iris*, White; the *Pupil*, of the colour of *Honey*.

A SIXTH, with the middle Spot or *Pupil* encompassed with a grey *Iris*.

A SEVENTH, with the *Iris* party-colour'd, within, White; without, brown; and the *Pupil* also of the same colour.

An EIGHTH, with an ash-colour'd *Pupil*, the *Iris* of a pale *Amethystine* within, and white without. These with more variety of colours, are by some particularly called *NICCOLI*; qu. *Onyculi*.

A NINTH, which may be nam'd, The *BINOCULAR*; as having the likeness of two little Eyes. The Table on which Nature hath drawn them, is of the colour of *yellow Amber*, and semiperspicuous. The Eyes are white, with their *Pupils* of the colour of the palest live *Honey*.

A TENTH, distinctly called *BELI OCULUS*: the *Iris* whereof is Grey; the *Pupil*, and the rest of the Eye, Black.

An ELEVENTH, of the colour of *yellow Amber*, with grey Girdles, not round, as in all the former, but angular.

The

The *EMBRIO* of an *ONYX*. So I name it. 'Tis a half *Globe*, polish'd. The outer *Crust* or *Shell*, *Semiperspicuous*, and as hard as of a true *Oynx*. The part within, round, of an opacous liver-colour, and so soft as to be dissoluble with *Spirit of Nitre*.

A *PEBBLE* of kin to the *Onyx*. 'Tis round or globous, and on the two opposite sides, a little prominent. About an inch in *Diameter*. The outer *Shell*, yellowish; the middlemost, red; both opacous. The intimate Part, diaphanous, and of the colour of a glowing *Coal*. It seemeth to me, That as some *Pebbles*, so many more *Flints*, are a sort of *ONYX*. The *Onyx*, amongst other things, is used for the making of *Cups*; of which, King *Mithridates* is said to have had two Thousand. Sometimes so big, as to serve for *Statues*. At *Rome*, in the *Basilica* of *St. Peter*, there are (or were in *Boetius's* time) six little *Onychine Columns*. (a) They grow both in the *East* and *West-Indies*, and in *Europe*. (a) Boet. lib. 2. de Gem. & L.

The *ONYCHATE*. Betwixt an *Onyx* and an *Achate*. Composed not of *Zones*, or *Balls*, but of *Plates*, perspicuous and ash-colour'd, mixed.

ANOTHER, of a Globous Figure, consisting of *Plates* ash-colour'd and brown: like a little turn'd *Bowl* of *Ash-wood*.

A *THIRD*, consisting of *Black*, and *Horn-colour'd Plates*, mixed together; these latter, being also stained with red spots.

The *PSEUDOPALUS*. 'Tis of a pale blewish *Water*, like a *Fishes Eye*, or a drop of *Skim'd-Milk*, with some *Rays* of yellow.

ANOTHER, growing to a thin *Crust* or *Matrix* of an *Iron-colour*.

This, and the *Opalus* it self, the softest of *Gems*. (b) They are now found principally in *Hungary*. (c) The *Opalus*, saith *Boetius*, hath its variety of colours, only by *Refraction*: (adds *Laet*, (d) like those in a *Prisme*) for if it be broken it looseth them. 'Tis true, that these colours are produced by *Refraction*: yet not as in a *Prisme*; as not depending upon the *Figure*, (for they will not be produced in other *Stones* of the same figure) nor so much as any flaw or flakiness in the *Stone*; but its peculiar *Texture*, which (b) Boet. de Gem.
(c) Tavern. Voyages.
(d) Lib. 1. de Gem. c. 13.

causeth those Refractions. *Tin* and *Venis-Glass* melted together, imitate an *Opalus*. (a) See also the *Phil. Trans.* hereof. (b)

(a) Porta.
(b) Num. 38.

The **ONYCOPALUS**. By some called *Oculus Cati*. It hath the *Zones* or *Rings* of the *Onyx*, of a pale White. The best of these are found in *Zeilan* and *Pegu*. Much harder than the *Opalus*. It might be try'd, whether this Stone doth in any degree partake of the strange property of the *Opalus*; some of which, being only steeped a while in common water, will become *Transparent* for some time. (c)

(c) Lact, ubi
supra.

(d) Fossil.
Nomencl.

The **CALCEDONY**, i. e. *Onyx Chalcedonius*, as *Kentman* not amiss. (d) This is polish'd and set in a Frame. Above four inches long, and near as broad. Semiperspicious, almost like to a piece of grey *Ice*. Consisting of white and most perspicuous parts so mixed together, as to look in some sort like a *Honey-Coom*.

Another small one, with a pointed and sexangular polish at both ends.

This Stone is next in hardness to the *German Agate*. The clearest, with a pale cast of blew the best. In *Germany*, being cut into thin broad *Tablets*, many have their *Arms* either engraven thereon, or painted on the back-side; preferring it to *Crystal*, as being harder, if good. Hereof also are made little *Mortars* for the powdering of *Emery*; likewise *Cups*, *Religious Beads*, &c. (e)

(e) Georg.
Agric.

(f) Theop.
de Lapid.

The **SARDIUS** or *Cornelian*, qu. *Carnelian*. A semiperspicious Stone. The best, by some called *The Male*, of the colour of *Flesh*, saith *Boetius*, with the blood in it. I add, but of a living Animal. But this is diluted with somewhat of an *Amber-colour*. Anciently not only This, but all the smaller *Gems*, were used especially for *Signets* and *Signet-Rings*. (f)

The **SARDONYX**. As it were compounded of the *Sardius*, and the *Onyx*. This is polish'd, and so the better shews it self. It consisteth of White and Blackish Rings, one within another. And stained both with red, and pale green Spots interjected. The *Rings*, with the help of a *Glass*, appear much more numerous, curiously representing those in the *Root* of *Taraxacum* or *Dan-de-Lyon*, cut transversely. Note also, That the said *Rings* are properly so call'd, only in the polish'd Stone; being, when entire, really so many Balls,

as

as in the *Bezoar* or *Onyx*, one within another. This Stone is found in several parts in *Asia* and *Europe*. Harder than the *Onyx*, or the *Agate*; and is therefore figur'd with *Emery*. Hereof anciently *Cups* were made, and those *Dishes* call'd *Vasa Myrrhina*. See *Worm*.

The *JASPI*. An opacous Gem; always, faith *Laet*, (a) ^{(a) Lib. de Gem.} with some kind of earthyness. But I take this to be only the property of the *Lapis Nephriticus*. 'Tis found of most colours; of which here is some variety.

A GREEN *JASPI*, stained with White Spots.

A Flesh-colour'd *JASPI*, with Blackish *Striæ*.

ANOTHER, stained with Purple and Blew Spots mixed together.

A FOURTH, stained with white and red Spots.

A FIFTH, Variegated with White, Carnation, Red, dark Green, and bright Green Veins and Spots. Very like to those, which *Boetius* faith are plentifully found in *Bohemia*.

A GEOMETRICK *JASPER*. It seemeth at least of affinity with the *Lapis Sanguinalis* described in *Boetius*. (b) ^{(b) Lib. 2. c. 184. out of Monardes.} But is certainly one sort of *Lapis Cruciformis*. (c) ^{(c) See Aldrov. Mus. Metall.} This here is polish'd into a plain Oval Figure, or flat on both sides. About an inch and $\frac{1}{2}$ long, and $\frac{1}{4}$ thick. In the centre or middle part of both sides stands a Rhumb or Diamond-square part, of a blackish Green. From the four Angles whereof are produced as many Lines of the same colour; and from each of these, two more, at acute Angles; the extreme parts whereof compose four more green Parts, as it were half Rhumbs: all joyn'd together with a circle near the *Rim* of the Stone. Amongst these, some yellow and red Spots are sprinkled up and down.

A Bag of a course sort of *JASPER* Stones, knockt off from those in *Wilts-shire* near *Marleborough*, called *The Grey-Weathers*. Given by *John Aubrey Esq;*. So hard, that no Tool will touch them. Generally of a light Grey, some almost white, many of a dirty red.

Another, of a blewish Grey. Taken from a like shelf of Stones at *Stone-heng*. 'Tis hard enough to scratch Glass.

Another like a green Pebble, found in one of the Streets of this City. Where also, faith the fore-mentioned Person, many more are met with, and that they are a sort of *Jasper*, brought, as *Ballast*, from the *East-Indies*.

The JASPACHATES. 'Tis polish'd, and so figur'd, as to look like one half of a *Pear*, with the Stalk, Coar, and dead Flower cut out. Curiously beautify'd with Yellow, Purple, and Blood-red Spots, immerfed in the Horny and Semiperspicious colour of the *Agate*; with which also 'tis equally hard. This also is a kind of *BLOOD-STONE*: as all other *Jaspers* with red Spots.

The JASPONYX. 'Tis polish'd with an Oval Figure. Composed of white *Zones*, besprinkled with White, Brown, and Red Spots.

Another of a courser kind, compos'd of Green and Ash-colour'd Plates. Like that *Marble* described by *Imperatus* with parallel black Lines.

The JASPAMMITES. So I call it; Having the Figure of the *Ammites*, with the Colour and Hardness of the *Jaspis*. For 'tis composed of little orbicular Stones, somewhat bigger than a *Pepper-Corn*; all green without, and of a dark Purple in the centre. So as they seem also to have been once little crufted or shell'd Balls, as those of the *Ammites*, hereafter describ'd.

The *Jaspis* grows in *India*, *Phrygia*, *Thracia*, and *Bohemia*. Next in hardness to the *Agate*. Sometimes so big, as to be used for Statues. Of great esteem, as an *Amulet*, for the stanching of all *Hæmorrhages*. Of its Effect herein, see some Cases in *Boetius*; one of them a most remarkable one. (a) See also two others, in Mr. Boyle, *Of Gems*. lib. 2. c. 102. The specifick Virtues ascribed to This and divers other Stones, seeming almost incredible unto some: Mr. Boyle, to render an intelligible Account of the same; doth reasonably suppose, That all opacous Medical Stones have been, some *Bolus*'s, some *Ores* of *Metals*, or *Minerals* of kin to *Metals*, so advantageously alter'd, as by application only to become Sanative. (c) The *Green-Jasper* is by some prefer'd: but that which *Boetius* us'd in the Cases above-mention'd, was wholly Red. (b) Pag. 177, 178. (c) Of the Virtues Of Gems, p. 171. 172.

The NEPHRITICK-STONE. Of affinity with the *Jaspis*, and rather harder. Of several colours; but no one of two, nor any Red: for the most part of a pale Green. It hath some softer parts intermixed, which make it look sometimes as if it were a little oily; and for which cause it admits not of a perfect polish. Of these here are two Species; first, The

The NEPHRITICK STONE of *Brasile*. *Gemma, Gesnero, Oripendula*. Described by the Author of the Name. But this is smaller, and seems to be broken. Of a pale blewish Green, with some pores containing a whitish substance. Polish'd and shaped into a little Column. The better sort of the Natives of *Brasile*, to distinguish themselves, when they go abroad, wear this Stone (as we Rings on the Ear) upon their Lip; which is bored in their Childhood for that purpose.

ANOTHER, of affinity with the former. It consisteth mostly of parts of a dark Green; yet glossy; and firmly cohering. Yet so as in several conspicuous pores to contain a soft whitish substance.

This Stone, although of no beauty, yet is placed amongst *Gems*, for that it is highly esteemed, as an *Amulet* against *Nephritical* Pains, and the Stone and Gravel in the Kidneys. Of the admirable effects whereof, in divers Cases of this Nature, see the Relations of *Monardes*, and from him of *Boetius*; as also from a Noble Person, his Kinsman. (a) The Green one with black spots, is commended by many. But *Laet* saith, (b) he had one almost of the colour of *Honey*, which, upon frequent experience, he found to do all that *Monardes* relates of it. (a) Lib. 2. c. 110.

The TURCOIS. So called, because brought to most places from *Turkey*, or those that trade from thence. By the *Indians*, *Perose*; for that it is found, most abundant, saith *Cerutus*, (c) only, saith *Tavernere*, (d) in *Persia*. See the Description hereof in *Boetius*. This here, is all over tuberos on the top with round Knobs, of several sizes, from that of the head of a small *Brass Nail* to that of a *Pin*; some of a blewish, others of darker Green. Within (somewhat like the *Onyx*) disposed into *Zones*, mixed with spots: both of a Greenish Black. 'Tis two inches broad, and near three in length: a great one, if, as *Boetius* saith, it seldom exceeds the bigness of a *Walnut*. (c) Mus. Calceol. S. 3.

Another, about as big as a *Filbert*.

A Third, a small one, like those set in *Rings*.

The MOTHER of the TURCOIS, as is supposed. Found in the Mines of *Herngrunt* in *Hungary*; and given by *Dr. Edward Browne*. Here are two Pieces. One of them, for the greatest part, blew; with some places black.

In

In which is also immerfed a fort of fmall Sand-colour'd Stones, fo hard as to fcratch Glafs. The other, hath alfo a mixture of fome parts that are Green. The Blew and the Green, are both, and they only diffoluble upon the effufion of *Acids*.

(a) Boet. de
Gem.
(b) Laet de
Gem.

The beft of thefe Stones are the Bleweft. (a) They have alfo this property; *fc.* to look blew by Day, (b) and Green by Candle-light. Many, faith *Boetius*, have judged this to be reckon'd by *Pliny*, amongst *Jaspers* with the Name of *Boreas*. But either *Pliny* and the Ancients, or thofe that make that judgment of them, were greatly miftaken. For this is a very foft Stone, and eafily diffoluble, with *Ebullition*, immediately upon the effufion of fome, efpecially Nitrous *Acids*: and may be fcraped with a *Knife*. So that I am of Opinion; That 'tis nothing elfe but a fort of *Ærugo* in fome meafure petrify'd. Which alfo is further confirm'd in that it doth not only refemble that in Colour, but, being (as it is eafily) burnt, is of the fame Taft. So that it is no marvail, if this Stone, with Age and efpecially much worn and expofed to the Air, loofeth the beauty of its colour. And that it may be reftored to the fame by *Oil of Vitriol*; which eateth off its faded Surface.

CHAP. V.

OF REGULAR STONES.

AS *Gems* are diftinguifhed chiefly by their Colours; fo other *Stones Regular*, by their external *Forms*. This is of two general kinds. Such as is *Circumfcriptive*, or depending upon the whole *Stone*, as *ex.gr.* in the *Eagle-Stone*; and this is properly call'd the *Figure*. Or fuch as is *Accumulative*, where there is a repetition of the fame Figure in feveral parts, as in *Mufcovy-Glafs*, compofed of parallel Plates: and fo for the reft; whereof in their order.

A GLOBULAR PEBBLE, an inch and $\frac{1}{4}$ in Diametre, whitifh and femiperspicious. It feems to be an Affay towards the *Eagle-Stone*, hereafter describ'd.

A

A CLUSTER'D PISOLYTHOS. It consisteth of Globular and bay Stones, united together with an Ash-colour'd Cement: But this is very hard, and stirs not with *Acids*. *Boetius* and others figure a Cluster of these, but somewhat bigger.

This *Stone* may seem to belong to the second general kind above-said. But is really a heap of distinct *Stones* in one Bed. Which is also to be understood of others alike.

ANOTHER, composed of *Globular Stones*, consisting of a whitish, and soft or friable substance; yet gritty, and indissoluble with *Acids*. United together with a brown Cement.

A SINGLE one of the same Figure, but bigger; *sc.* as big as a Physical Pill. As also semipellucid, almost as the bay *Amber*. Very hard and indissoluble with *Acids*. *Besler* figures some of these, with the Name of *Pisa majora lapidea*.

The SINEPITES, as it may be called. Being a Cluster of small hard *Globules*, like *Mustard-seeds*; and united together with an obscure or dull Red Cement. Given by *Sig^r. Boccone*.

The MECONITES. A Cluster of other like *Globules* no bigger than *Poppy-seeds*. See one of these in *Boetius* and *Besler*. These two last, are properly of the *Hammites* kind; but not the *Pisolythos*, although accounted so by *Boetius*. Of these *Globules*, it is observable with the help of a Glass, That although they are so very small, yet are they shell'd, or composed of little *Balls* one within another, as the *Bezoar-Stone*.

The CLUSTER'D STALAGMITES. A Congeries of *Globular Stones*, like so many petrify'd Drops; of the colour of Oriental *Bezoar*; cemented together with a kind of *Gypsum*. The whole Mass, which here is polish'd, is two inches and $\frac{1}{2}$ square, and an inch high. This, and the following *Stones* of affinity herewith, differ from the five former, not so much in figure, as in substance, these being all instantly dissoluble with *Acids*. So that they seem to be a kind of *Gypsum*, first dissolved in some Mineral *Menstruum*, and after setting in this Figure.

The CORALLINE STALAGMITES, also cluster'd. It
con-

consisteth of little round Stones of the bigness of the former, but of the colour of red *Coral*. Cemented together with a sort of *Gypsum*. It is dissolved, upon the effusion of any strong *Acid*, with a strong *Effervescence*.

The POROUS STALAGMITES. 'Tis a ruder *Species*, the Stones of which it is composed, being not so distinct and round, as in the former. Cover'd all over with one common Crust. Yet most of them pounced with small or more open pores.

A SINGLE one; call'd *PISUM CAROLINUM*; because frequently bred in the *Caroline Baths*. Whitish, smooth and dense; and near as big as a *Pistol Bullet*.

Two SINGLE ones. Given by Sir *Philip Skippon*. Of a glossy Ash-colour, and very dense substance: yet easily dissolved with *Spirit of Nitre*. These are somewhat angular.

Two more, which are TWINS. These are perfectly round, except where they joyn together.

A Great TIBULINE SUGAR-PLUM. This and the other Rough sorts the *Italians* call *Confetti de Tibuli*; the place (not far from *Rome*) where they are bred. 'Tis above $\frac{1}{2}$ an inch in Diametre, Globular, White, and Rough; exactly like a great Confet.

A Parcel of SMALL ones; white, round, and as it were granulated: just like *Carvy Confets*, and such like. *Besler* figures several of these under the Name of *Petrify'd Anise-seeds, Fenil-seeds, &c.*

The SUGAR-ALMOND, bred also in the same place. In colour, figure, size, and surface, so like to the rougher sort which *Confectioners* sometimes make, that, excepting the Taste, nothing can be liker.

Three STONES found very deep under ground near *Hartford* in *New England*. One of an Oval Figure, flatish, and having a little *Globule* standing upon its centre. Another, two half *Globes*, joyn'd edge to edge. The Third, much bigger than the former, of a circular Figure, and flat; an inch and $\frac{1}{4}$ over; almost like the *Caps* worn by *Under-Graduates* in our Universities. All soft, and fine, or not gritty, and not unlike a hard *Bole*. *Spirit of Nitre* dissolves them with *Effervescence*.

A little round, flat, and blackish Stone, resembling a
Medicinal

Medicinal TROCH, or a thin CAKE of *Terra sigillata*, having as it were the Impression of a small *Seal* on one side. 'Tis a perfect *Pebble*, not affected with any *Acid*.

The EAGLE-STONE. *Ætites*. All the former *Stones* were round and solid. This is hollow. Named from a vulgar opinion, That the *Eagle*, when she sits, carries it to her Nest, to keep her Egg from being addle. And this, joyn'd with another, That Bodies operate according to their *Signature*: as this *Stone*, which often contains, or if you will, goes great with another *Stone* within it. Several sorts hereof are here preserv'd.

The FLORID Male EAGLE-STONE. A rare kind. 'Tis a perfect *Flint*, and semiperspicuous; of a Globular Figure, and as big as a good big *Apple*, or near three inches in Diametre. Flourished all round about with several sets of *Rings* one included within another, with some similitude to so many little *Roses* or double *Crowfoot-Flowers*. 'Tis very ponderous, being almost solid. Yet hollow at the centre; containing not one, but several small *Stones*, as is argu'd from the noise they make, upon shaking the *Stone*.

An ANGULAR or Ridged Male EAGLE-STONE. This also is about the bigness of a good large *Apple*. Of a brown colour, but daubed over with a kind of *Okre*; and was therefore probably bred in a Bed of the same. 'Tis very heavy; which argues it almost solid, as the former, and to have only a small hollow in the centre.

An ORBICULAR EAGLE-STONE. About the bigness of a midling *Apple*. The outside, rough and brown. Inwardly black. The Concave surface daubed with a sort of *Okre*; a quantity of which, 'tis likely, it once contain'd.

An OVAL EAGLE Stone. About as big as a midling *Walnut*. Without, blackish and rough, as it were granulated with some semiperspicuous Sands. Smooth within, and of a spruce *Okre* colour. On one side, it hath an oblong Aperture, with a smooth Lip as it were turned outward.

One half of an OVAL EAGLE Stone. 'Tis near three inches in Diametre. The inside rough-cast with small Grains, in size, like those of *Bay-Salt*; so hard as to cut Glass.

The FLAT round EAGLE Stone. Of a brown colour, and figur'd like a *Troch*.

The AMYGDALINE EAGLE Stone. Shaped like an *Almond*. Of a glossy brown, like half bright Iron. It contains a sort of *Bole*, of the colour of *Fullers-Earth*.

The *Eagle-Stone* which containeth no *Stone*, but *Earth*; is called *GEODES*. *GEÆTITES* were more exprefs.

ANOTHER, of the same figure and bigness; but somewhat flatter.

A Rough and hard EAGLE Stone, the Concave surface whereof is daubed with a soft white wash, a kind of *Gypsum*, dissoluble with *Spirit of Nitre*.

ANOTHER Hard one, immersed in *Iron Ore*. All these are Naked. Those that follow have a soft *Coat*.

A COATED EAGLE Stone: A hollow *Flint*; one way, near two inches in Diameter, and almost round. Cover'd with a kind of white *Earth*, about $\frac{1}{4}$ th of an inch thick: yet not Chalky, but *effæte*, making no *Effervescence* with *Acids*. Containing several sparks or grains of *Flint*, cluster'd in a round Lump, together with some of the like *Earth*, as without.

A little Flinty LUMP taken out of another of the same *Species*.

TWO more EAGLE Stones, of the same *Species*, of a midling size, and almost as round as a Ball. One of them as big as a good big *Walnut*.

A FOURTH, bigger than a *Musket-Bullet*, and as round. Cover'd, as the three former, with a white earthy Coat; and containing the like substance in the centre. The main Body of all these, is either true *Flint*, or of a hard substance approaching to it. All these are by some called *Males*.

The FOEMALE EAGLE Stone. 'Tis round, and in a manner Oval. As big as a good large *Apple*. Ash-colour'd without, and white within. Of a soft friable and chalky substance, instantly dissoluble with *Acids*. From the outside, to the Concave, $\frac{1}{2}$ an inch thick. Containeth a soft white chalky Stone, filling up its whole hollow, and answering to it, as the *Yelk* doth to the *White* of an *Egg*. This Stone is by *Pliny* called *CALIMUS*.

ANOTHER, somewhat harder. 'Tis also round, and bigger

bigger than the former, and the sides above $\frac{1}{2}$ an inch thick. Rough on the outside, and smooth within. Yet so, as to be furrow'd with certain shallow Rings. To which also the *Calimus*, therein contain'd, exactly answers, as any Metal doth to the Mould in which it is cast. Both of them make an *Effervescence* with *Acids*.

The *CALIMUS* of another *Eagle-Stone*, as big as a good big Gall, and knob'd in the same manner.

Several *Species* of this *Stone* are figur'd by *Aldrovandus*.^(a) ^{(a) Mus. Met. tall.}

The flinty *Eagle-Stone*, and many other *Flints*, if observ'd when they are broken, seem to be an Assay towards the *Onyx*.

The *Eagle-Stone* is found in *Apulia*, *Germany*, *Misnia*, &c. Much accounted of by some, as an *Amulet* against *Abortions*.

The SEMIGLOBULAR TOAD-STONE. *Lapis Bufoneus* s. *Garatronens*. It looks like the the one half of a hard flinty *Eagle-Stone*; and probably, is nothing else. The Diameter $\frac{3}{4}$ of an inch.

The SEMIOVAL TOAD-STONE. 'Tis an inch long, $\frac{1}{2}$ an inch over, of a brown colour, and flinty.

The Long SEMIOVAL TOAD-STONE. This also is flinty, and of a shining brown, or the colour of Oriental *Bezoar*, being polish'd. 'Tis about an inch long, and near $\frac{1}{2}$ an inch over. *Besler* figures this, with the Name of *Batrachoides*.

Another sort of *Toad-Stone*, semiglobular, and solid, s. with a flat base, is described by *Gesner*. ^(b) Thus far of ^{(b) Lib. de Lap. Fig.} *Stones* more Round. I shall next describe those which are *Cylindrick*, or near that Figure. And first the *Osteocolla*, of which here are several *Species*.

The SOLID or Pithless KNIT-BONE. Ranked by *Kentman*, ^(c) and not improperly, amongst the sorts of *Oste-* ^{(c) Fossil. Nomencl.} *ocolla*. Yet obtains the peculiar Name of *ENOSTEOS*: being porous, light, spongy, and cylindrick; so as to look just like the inward part of a Bone, or of *Harts-Horn*.

The KNIT-BONE with a small PITH. 'Tis bended almost like the Letter *s*. Cylindrick, and three inches round. Almost solid, yet containeth a very small *Pith*. The outer part, of an Ash-colour, and gritty or fabulous. The *Pith*, like most white Chalk. Both of them make a conspicuous *Effervescence* with *Acids*; but especially the *Pith*.

The GREAT-PITH'D KNIT-BONE. This is not a single one, but a Cluster. They stand together parallel, equal to the thick end of a *Tobacco-Pipe-Stalk*; without exceeding smooth, and of a yellowish colour, somewhat like that of the Plates in the *Ludus Helmontij*, hereafter described. Filled with a very large *Pith*, answerable to that in an *Eldern-Branch*, hard and stony, and of a blewish colour, like that of blew *Marle*. The spaces between the several *Cylinders*, fill'd up with another sort of *Stone*, of the colour of old *Elm*. The yellowish *Cylinders*, being rub'd hard, or scraped, hath a strong stinking scent: but what *Species* to compare it too, doth not at present occur. They are presently dissolved with *Spirit of Nitre*.

ANOTHER CLUSTER like the former; saving, that the *Cylinders* stand together without any, or with little, order: and that the brown and blewish *Stones* are both mixed in Veins, and several of the *Cylinders* hollow.

The EMPTY KNIT-BONE. This is neither solid, nor hath any *Pith*, but a *Pipe*; yet with a very small bore. Smooth both within and without. And *transversely* striated, as the *Belemnites*, hereafter describ'd.

ANOTHER, somewhat more hollow. This also is *transversely* striated, as the former; but without rough and of an Iron-colour.

A THIRD, most hollow; knobbed without, and of an Ash-colour.

Of these *Stones*, see the Relation especially of *Joh. Chrystophorus Beckmannus*, Physick Professor at *Frankfurt*; (a) who observes, That they grow in a sandy, seldom or never in a clay-Ground. Sometimes two mens depth; and with Branches side-ways. Taper'd, as in Plants; where thickest, equal to an ordinary Arm; the small Branches, to ones little Finger. The Place where found is noted by a white fatty Sand, the rest yellowish round about; and underneath a dark, moist, and fatty putrid substance, like rotten-Wood, running in Veins and is the Mother of the *Osteocolla*. So that it seems to grow somewhat after the manner of the *Entrochus*, or *Stelechites* above describ'd. 'Tis found most in *Saxony*, and the *Palatinate*.

This *Stone*, as is indicated by its Name, is highly esteemed for expediting the *Coalition* of broken Bones; 3j hereof being

(a) Phil.
Trans. N. 39.

being given and repeated for above five days together. See one or two very remarkable Histories hereof in *Boetius*. (a)

(a) De Lap.
& Gem. Lib.
2.

The Larger Hollow STALACTITES, or WATER-PIPE. The Greek Name supposeth it to grow somewhat after the manner of *Iceicles*, from *Lapidifick-Waters*. Yet how it should grow hollow, as this, is somewhat hard to conceive. For hereby, it seems rather to grow or sprout upward, as the *Stelechites*. Only with this difference, That as that grows from an open Bed: this probably, from one under Water. Whence I take leave for the *English* Name. 'Tis three inches long, in thickness equal to the little Finger. Of a *Cylindrick* Figure, saving that at both ends 'tis a little more slender; whether naturally, appears not. Composed of several ash-colour'd and blackish Crusts, exceeding thin crispe and brittle, not ill resembling a rouled *Wafer*. The Bore is lined through with a small granulated *Candy*. 'Tis instantly dissolved with *Spirit of Nitre*.

ANOTHER, consisting wholly of white *Crusts* or *Wafers* one within another.

The SMALL WATER-PIPE. 'Tis a Cluster of very small *Tubes*, with the Bore so small, as scarcely to be seen without a Glass. Rough all over with a tuberos *Crust*. They are found in *Germany*, *Moravia*, and other Parts. One Drachm hereof in Powder, is a potent *Sudorifick*. (b)

(b) Boet. de
Lap. & G.

A Stone like a *Pebble* with small TUBULAR KNOBS upon it, like the *Primordia* of a *Water-Pipe*. They are so small, that their hollows cannot be observ'd without a Glass. The Stone on which they grow, though very hard, yet makes a strong *Effervescence* with *Spirit of Nitre*. Thus far of *Cylindrick Stones*.

The CONICK STALACTITES, solid. 'Tis about three inches long; the top sharp, the middle $\frac{1}{2}$ an inch over; the base, an inch, with four or five excentrick *Crusts*. The whole composed of several *Crusts*, one within another, as the *Water-Pipe*. Yet not hollow, as that, or rather not empty, but filled with a Red stony substance. Being kroken, it shines like the *Lapis Judaicus*. Without, smooth, of an Ash-colour, with some little cast of red. Instantly dissolved

(a) Musæum
Metallic.

dissolved with *Spirit of Nitre*. *Aldrovandus* (a) hath one figur'd like this; but by himself, or by *Ambrosinus*, call'd *Stelechites Pyramidalis*; very improperly.

The CONICK STALACTITES, hollow. 'Tis three inches long; at the top, which is now open, $\frac{1}{4}$ over; in the middle, near $\frac{3}{4}$; the base spread out, with several round *Crusts* on one side, like half bubbles, to the breadth of above an inch. On the opposite side, with a short single piped one. All of them contained together within the utmost *Crust*. Smooth and ash-colour'd without, within pure white.

The Black BELEMNITES. The generick Name is from the shape, like that of a *Bolt-head*. This *Species* is outwardly of an ash-colour, but black within: and therefore by some called *Coraceas*. Radiated as most of them are, with transverse *Striæ*. And bored at the thick end, which is not so usual, with a *Conick* hollow. See the Description of two or three sorts in *Boetius*, *Wormius*, and others.

The WHITE BELEMNITES. 'Tis *Conick* as the former; but the Rays not so plain. Together with its white colour is joyn'd some little transparency.

The bigger YELLOW BELEMNITES. Particularly called *Dactylus Idæus*; for that it is in shape and bigness like a little Finger; and was first, or is now chiefly, found upon Mount *Ida*. 'Tis solid, semiperspicuous, and of the colour of yellow *Amber*. They have usually a kind of notched Ridge all along one side; but this hath two opposite ones.

ANOTHER, with a little Hollow fill'd up with a Pith of Earth.

A CLUSTER of broken pieces of the *Belemnites*.

The SHELL'D BELEMNITES. *qu. Stalemnites*. Opaque, and of the colour of grey Horn. Pointed at both ends, as the *Belemnites* is at one. And at one end, sheweth six or seven shells one over another, as in the *Stalactites* above describ'd. From whence I have nam'd it.

(b) Fossil.
Nomencl.

Some of these being rub'd, take up *Chaff* or other light Bodies, as *Amber* doth. *Kentman* (b) mentions one of an Ash-colour, which being rub'd, smelt like a burnt *Cows Horn*. And a white one, which smelt not much unlike to white

white *Ambar*. They are found in *Germany*, and other Parts, sometimes in *England*. They all make a strong *Effervescence* with *Acids*. Thus far of *Stones* simply *Conick*.

The **WORME-STONE**. 'Tis now broken at one end, yet about two inches and $\frac{1}{2}$ long. Consisteth of about five solid Rounds, winding from the bigger end (about $\frac{3}{4}$ of an inch over) so as to make a spiral *Cone*. Not much unlike a Steel Worme used for the drawing of *Corks* out of *Bottles*.

Another of the same shape and bigness. This *Stone* I find neither figur'd, nor mention'd by any Author, saving only *Olearius*. (a) They were taken out of the midst of a Rock. (a) A Dutch Museum.

A **NETED-STONE**. *Lapis retiformis*. It consisteth of black and roundish portions, severally surrounded with Veins, of an Okre-colour, running one into another after the manner of *Net-work*. Along the middle of each Vein (about $\frac{1}{8}$ th of an inch broad) runs a small Thread or Line, almost of the same colour.

Another, with the *Air'es* of the *Net-work* not so black, softer, and somewhat flaky.

A **FLINT** of a dull Red, with the Figure, almost, of a λ encompassed with six or seven Rings.

The **FLAT BOLTHEAD**. *Anchorites*. Of affinity with that well described by *Wormius* (b) with the Title of *Silex venabuli ferreum Cuspidem exactè referens*. By *Moscardo*, (c) with that of *Pietre Ceraunie*; who also figures it with three or four Varieties. This like those, is a perfect Flint, and semiperspicuous. 'Tis likewise in the same manner, pointed like a *Speer*. Having at the other end, like those of *Moscardo*, a short Handle. But moreover, hath this peculiar, that 'tis pointed or spiked also backward on both sides the Handle; with some resemblance to an *Anchor*, or the Head of a Bearded-Dart: from whence I have nam'd it. 'Tis likewise toothed on the edges, and the sides as it were wrought with a kind of undulated sculpture, as those before mention'd. (b) Mus. lib. 1. Sect. 2. c. 13. (c) Mus. lib. 2. c. 50.

ANOTHER, different from the former, in that it is longer, hath a deeper Indenture, but no handle. Both of them strike fire like other *Flints*. That of *Wormius* was found in a Hill in the Diocess of *Ripen*.

Not

(a) Mus.
Septal.

(b) Musæum

Not only *Moscardo*, but others reckon these amongst the *Cerauniæ* or *Thunder-bolts*. So called, because believed sometimes with Thunder to shoot down with violence out of the middle Region. Amongst other Relations hereof, that of *Terzagi* (a) is very exprefs; who saith, That the Corps of one struck dead with Thunder, being inspected in the presence of *Septalius*, and several others, and a black Wound observed about the Hip, and searched to the Bone; they found therein a round and edged Stone, which being broken, had a very strong sulphurous stink. With this Author, I scarce think any thing of this nature incredible; to those that read the Relation given at large by *Wormius* (b) of the *Norwegick Mouse*.

Thus far of *Regular Stones*, whose external Form is *Circumscriptive*, or at least depending upon the whole Stone. I shall now describe those, whose Form is *Accumulative*, or where there is a repetition of the same figure, or near it, in several Parts.

The GRAPE-STONE. *Botrites, Wormio*. Here are two or three sorts. One solid, of a yellowish colour, an inch and $\frac{1}{2}$ long, knobbed with several small Clusters, like a young bunch of *Grapes*.

The HOLLOW GRAPE-STONE, with high Knobs or white Berries cluster'd all round about, as in the former, and somewhat thicker.

A SEMI-GRAPE-STONE, with white Drops or Berries only on one side. They all make a vehement *Effervescence* with *Acids*; and are a sort of *Stalagmites*, next of kin to the *Confetti di Tibuli* before describ'd.

The STAR-STONE. *Asteria vera, Boetio*. Generally of a $\frac{1}{4}$ or $\frac{1}{2}$ an inch in Diametre, consisting of several Joynts, evenly piled one upon another, of a Pentagonal Figure, like a *Star*, and with the signature also of another on both sides, which is composed of short transverse *Striæ*. When broken, it shines like the *Lapis Judaicus*, or the *Entrochites*; to which latter it is next of kin. Sometimes they are found single. When consisting of more Joynts, it may rather be call'd *Synasteria*. Several both of the joynted and singles ones are here preserved.

A very hard Stone, a kind of Pebble with the signature of the *Asteria* upon it.

Mr.

Mr. *Lyster* hath given a particular Account of this Stone, and its varieties in several Figures; published by Mr. *Oldenburge*, (a) together with some Notes of Mr. *Ray* (a) Phil. thereupon. Mr. *Lyster* found the fairest of them near Bug-^{Trans. N. 112.} *thorp* and *Leppington* in *York-shire*, in a blew Clay.

The STARRED-STONE. *Astroites*. So called, for that being tabulated, or polish'd to a plain, it appears adorned with little Stars, about $\frac{1}{4}$ or $\frac{1}{8}$ th of an inch in Diametre. *Boetius* conjectures *Pliny* to reckon this Stone for a sort of *Agate*. Whether that be so or no, himself is greatly mistaken (b) in affirming as much: this being a very soft (b) Lib. 2. Stone. The same Author takes notice, as of a strange c. 145. thing, That this Stone being put into *Vinegar* (c) will move (c) C. 147. up and down in it. Whereas it proceeds (as Mr. *Lyster* also observes of the *Asteria*, which he calls the *Astroites*) (d) Phil. only from the *Ebullition* following upon the immersion: ^{Trans.} and happens to any other Stone dissoluble with *Acids*, if immersed in small pieces.

Another, two inches long, and near as broad. This is unpolish'd, and seems to be but part of a far bigger Stone. So that although the figure which *Boetius*, and some others give, is but small, *sc.* not an inch long: yet is it sometimes of good bulk.

The ASTROCHITES; polish'd with the figure of a *Cross*. The Stars are here more round, than in the former. The spaces between the several Stars and Rays, of a dark blackish colour. The Rays or Stars themselves are pale. And also surrounded with a toothed Circle; so as not unaptly to represent the Wheel of a *Watch*: from whence I have nam'd it.

The imperfect STARRY-STONE. *Astroites Boetio* (e) (c) Lib. 2. *quartus*. In this the Stars are more obscure, and scarce ra-^{c. 164.} diated, but rather spots. But the Stone for substance the same as the former.

The WAVED Stone. *Astroites Boetio* (f) *tertius*; but (f) Ibid. improperly so call'd. For although it be, for substance, like the former; yet is not adorn'd with the likeness of Stars, but of Waves. The several Waves are composed of whitish transvers *Striæ*.

Another, with the *Striæ* more conspicuous.

The SEIVE-STONE. *Lapis Cribriformis*. A kind of
R r. *Tophus*.

Tophus. 'Tis of a brown colour, porous light and friable, as a *Pumice*. And perforated with many Pores more conspicuous, about as big as to admit a large *Pin*, and regular, *sc.* round, strait and fistular.

I now proceed to several *Spars*; of which, although some belong to Metals; yet here, have no Metal adhering to them. Those that have, will fall in amongst *Ores*. And first of such as are pointed, both soft and hard, reserving the Flaked for their place.

Let it only first be noted, That the specifick difference betwixt the *Stalactites* and the *Spar*, is, That the former, is always *Opacous*, and never *Angular*: the latter, always or usually perspicuous, and never round.

A *Silver-Ore SPAR*. About an inch and $\frac{1}{2}$ high, and three in compass. It consisteth of several *Crystals* sexangular and pointed, and composed into the figure of a great Bud. The four uppermost bigger than the rest. All semiperspicuous, of the colour of grey *Chrystal*; and seem to be as hard.

ANOTHER large Piece consisting of hard and sexangular *Crystals*, and of the same colour with the former. Taken from the *Coginnian Silver-Mines*. Given by Mr. Colepres.

Several other Pieces of the same, and given by the same Hand.

A METALLICK SPAR, of a pale AMETHYSTINE colour. 'Tis angular and pointed, as *Crystal*; but with sides more unequal. 'Tis also soft and brittle. Yet harder than some others. And hath no sense of *Acids*.

A SHOD. *Spuma Lupi*. The forerunner of the Load or Mother of the *Tin-Ore*. 'Tis both blacker, and harder than the *Mother-Spar*.

Another of the same, mixed of black, grey, and yellow.

The MOTHER-SPAR of the *Tin-Ore*.

ANOTHER, arising from a Whitish Bed, mixed with a kind of rusty red. The *Crystals* are angular, pointed, and soft, like the square *Lead-Spar*. Semiperspicuous, yet mostly cover'd with an angular and blackish shell.

A pretty hard Ash-colour'd and Opacuous *Spar*, growing near the *Tin-Mines*.

A YELLOW TIN-SPAR from *Ireland*. Given by Sir Rob. Moray. The several *Crystals* are angular, pointed, and soft; semiperspicuous like brown *Sugar-Candy*. Dissoluble with *Acids*.

An Iron-SPAR. A Cluster of small, pointed *Crystals*, almost of the colour of brown *Sugar-Candy*; but fader, and less perspicuous. 'Tis hard enough to cut *Glass*.

ANOTHER, Mixed. In the middle, it hath many *Striae*, of a *Lead-Ore* colour, running cross one against another. These are encompassed with other parts of the colour of yellow *Okre*. With which are also mixed some white and green spots. The *Stone* tasteth like white *Vitriol*.

A large Copper-SPAR. Given by Mr. Langerman. 'Tis a $\frac{1}{4}$ of a yard long, and near as broad. Consisting mostly of sexangular Points, upon a grey Bed, which is also mixed with Granulated *Spars*. The other side, all besprinkled with yellow *Mundick*.

A MUNDICK-SPAR; consisting of tabulated or flat and square *Crystals*, of the colour of Citrine *Amber*, and growing to a whitish *Matrix*.

Note, That almost all *Spars* of this kind, are composed of tabulated, and square *Crystals*.

ANOTHER, consisting of black shining *Crystals*, of the colour of *Jet*, and as broad as a *Dice*; and some of them almost Cubical. Being broken, the fragments are of an *Amethystine* colour. There are also, underneath, some whitish *Crystals*; above, some of yellow *Mundick*.

ANOTHER, partly plated, and partly pointed; of a black shining colour, like that of polish'd *Steel*. 'Tis very ponderous, and maketh no *Effervescence* with *Acids*. Yet soft and brittle. Which three Properties, belong to most, if not all, *Mundick-Spars*.

A SPAR with CONICK CRYSTALS. They are most of them an inch and $\frac{1}{2}$ long. All very close and continuous, excepting at their Points, as in the *Amethyst*. Semiperspicuous, and exactly of the colour of the best brown *Sugar-Candy*. Very soft; and easily dissolved with *Spirit of Nitre*. It was taken out of a *Portland-Stone*; and given by Sir Rob. Moray.

A SPAR with CRYSTALS TRIANGULARLY pointed. 'Tis a pretty round Lump. The *Crystals* so placed, that

the Angle of one, for the most part, answers to the side of another. Of a pale and semispersive colour, coming near to that of white *Sugar-Candy*. In which also small parallel *Streaks* of a brighter colour, are observable. Very soft, as the former, and dissoluble with *Spirit of Nitre*.

The *STYRIATED STALACTITES*. Of the same kind with the *Styriæformis* described by *Wormius*. It is a congeries of strait, round *Styriæ*, somewhat parallel, and as thick as a *Cherry-Stalk*, or small *Packthred*. Each *Styria* is composed of small, pointed and loose Grains, as big as those of *Salt*, piled in a strait line one over another. It makes an *Effervescence* with *Spirit of Nitre*.

The *MOSSE-STALACTITES*. Consisting also of Granulated *Styriæ*; yet not strait and parallel, but winding too and fro, and the Grains with bigger points; so as to resemble petrify'd *Mosse*.

I NEXT proceed to *PLATED-STONES*; and first such as are of a Rhomboid Figure.

A *CRYSTAL of TALK*. *Wormius* describes *Talk*, to be a *Stone* divisible into flat *Plates*, variously intricate, and divisible like *Silver*, which is all he saith of the form, and his words unintelligible. Far from a definition of that form, which, so often, as its Concretion proceeds freely on all sides, or without hinderance from any adjacent Body, it doth obtain: being then, a Congeries of flat, and perspicuous *Plates*, somewhat pliable, and figur'd into a kind of double Rhomboid; or as it were two Squares, with unequal Sides and Angles, clapt together, with the edges produced, to distinguish them: so, as to obtain twelve Angles, and ten Sides, *sc.* eight lesser, and two greater ones. A piece thus figur'd, I call *A Crystal of Talk*. And of this the form is both *Accumulative* and *Circumscriptive*: the difference betwixt which is shewed in the beginning of this Chapter.

An *HALF-CRYSTAL*, having only six sides, four lesser, and two greater ones; as if it were a perfect one, split.

A piece of *FOLIATED TALK*. It consisteth of several pieces, pellucid, cleveable, and something pliable, of a Rhomboid Figure, and composed together so as to resemble the indented leave of *Wild Clary*.

A large Piece of *TALK*, above $\frac{1}{2}$ a foot square.

A Piece of *TALK* taken out of the Ground in *Wiltshire*.

A lump of the TALK-ROCK near *Spiral*, in the upper *Carinthia*. Given by Dr. *Edward Brown*. It consisteth of broken pieces, like those of the *Selenites*, immersed in a white glossy Stone, stained with purplish spots, and so hard as to scratch Glafs.

Talk, although flexible, and regularly figur'd, yet feel-eth no *Acid*; and is of that obstinate nature, as neither to melt, nor scarce loose its colour, in the fire. Considering which, and that all *Salts*, yet known, will flow: I am induced to think, That it hath not its Figure from any *Salt*; but is almost a simple Earth *sui generis*. And that there are earthy Particles, as well as *Saline*, which are regularly figur'd, and of which this and some other *Stones* are composed. Hereof is prepared a wash for the Face, which some *Chymists* cry up for the best in the World.

A GREEN TALK-SPAR. The whole piece, is here of a rude Figure; but is easily broken into Rhomboid Plates, resembling those of *Talk*, from whence I have nam'd it. 'Tis tinged with a pale Green. It stirreth not with any *Acid*. Yet is not flexible, as true *Talk*, but brittle as *Glafs*.

A great Crystalline TALK-SPAR. So I call it. Sent by Dr. *Erasmus Bartholine*, together with a large account of it, published in a the *Phil. Transactions*. (a) And by the Dr. (b) himself in a distinct *Treatise*. 'Tis a foot long, $\frac{1}{2}$ a foot broad, and two inches and $\frac{1}{2}$ thick. Of a Rhomboid Figure, and the narrow sides likewise sloped, as in the *Crystals of Talk*. It breaketh also into parts of the same Figure, or near it. Yet not flexible, but brittle. Polite, colourless, and transparent, as the clearest *Chrystal*. Yet soft and dissoluble especially with Nitrous Spirits; and by a strong fire reduceable to a *Calx*. Of a very different nature from *Crystal*, although the said Dr. is pleased so to call it. When heated, it is of an *Electrick* Nature, or like *Amber*, taketh up straws and other light Bodies. That which he principally Notes is, That the Objects seen through it, in certain positions, appear sometimes single, sometimes double, and sometimes sixfold. Which he ascribes to a *Refraction* peculiar to this *Stone*. And to me, it seems probable, That this various *Refraction* depends upon the structure of the *Stone*, *sc.* as it is not one piece absolutely entire, but composed of several *Plates*; and those not all
in

(a) Num. 67.

(b) Experimenta Crystalli Islandici Diff-Di-aclastici.

in a like manner, but differently contiguous; so, as in some places, several *Plates* may make but one *Refraction*; in others, two or more. It was dug out of a very high Mountain in *Island*, one whole side whereof consisteth of this *Spar*.

TWO PIECES of the same Stone, about two inches and $\frac{1}{2}$ long, broad, and thick. Thus far of Rhomboid Stones.

The RHOMBICK LEAD-SPAR. Frequently found in the *Lead-Mines* in *Derbyshire*, and in others. By some called *English Talk*. But very improperly. For though it consisteth of several *Plates*, yet not flexible, but brittle as *Glass*. Besides, 'tis not of a Rhomboid, but Rhombick Figure, that is, a Diamond-square, or with the Angles unequal, the sides equal. Nor doth *Talk* feel any *Acid*, but this with *Spirit of Nitre* is easily dissolved. It breaks into pieces, which, though never so small, yet retain the same Figure. Being burned, it yieldeth a Lixivial Salt.

A clear FLINT, of the colour of yellow *Ambler*, with *Striae* on the sides shaped into little Rhombes.

A RHOMB of MUSCOVY-GLASS. This Stone is by most called *Selenites*. By some *Mariae Glacies*. By *Aldrov.* *Agricola*, and *Kentman*, *Magnetis*. By *Ambrosinus*, (a) con-
Mus. Metall. founded, under the same Name, with *Talk*. 'Tis indeed the nearest of kin to that of any Stone, being insensible of *Acids*; and consisting of very thin, perspicuous, glossy, parallel, and flexible *Plates*. Seldom found figur'd. But when it is, I suppose always, as it is here in this piece, *sc.* into a Diamond-square, *i. e.* with unequal Angles, and equal sides; whereas in a *Talk-Crystal*, both are unequal. It was taken out of Mount *Hæmus*.

A very white Piece of *Muscovy-Glass*.

ANOTHER, of a pale Green colour, with a kind of silver gloss, and semiperspicuous.

Another, of the colour of tarnish'd *Copper* mixed with black.

A lump of *Selenites*. 'Tis immersed in small pieces in a whitish Stone, a little *Diaphanous*, and so hard as to cut *Glass*.

This Stone grows in *Cyprus*, *Sicily*, *Saxony*, and many other places; especially in *Muscovy*, whence the *English* Name. Used in *Saxony*, and other places in *Germany*, in
Windows,

Windows, instead of *Glass*. *Ambrosinus* (a) mentions a (a) Ubi
Lead-colour'd sort so big, as to make not only *Tiles*, but supra.
Tables.

The BONONIAN STONE, Prepared and given by
Fr. Willughby Esq. 'Tis somewhat fissile, and may be here
ranked. Now of a greyish colour, and in some places like
the *Rombick Lead-Spar*. No *Acid* will touch it. Its qua-
lity of shining in the Dark, after its being exposed a little
while to the Sun, is now lost. See the manner of its prepa-
ration in *Wormius*. Given in Powder, (b) or the infusion (b) Mus.
of it, after calcin'd, is a strong *Emetick*. Wormian.

An odd SPAR, Green by day; by Candle-light of an
Amethystine colour. Softer than to cut *Glass*, yet harder
than the common *Rhombick Lead-Spar*.

A FLORENTINE SLATE. A sort of *Saxum fissile*.
Hereon is naturally represented the PROSPECT of a City,
Houses, Churches and Steeples, standing in length. To
make them all visible, it must be wetted.

ANOTHER, with the PROSPECT of a TOWN, lying
round upon the side of a Hill.

Another with the like PROSPECT; but shewing it, as
at a much greater distance.

Another, with one half of the TOWN on a Rock, the
other in a Plain. There are some of this kind in *Septalius's*
Musæum.

A SALTRAM SLATE. Very like to *Efford-slate* (used
for Writing, and Mathematick Schemes) but not all out so
good.

An odd SLATE with yellow *Mundick* in small Grains
or Sparks immerced throughout the body of it.

RUMPLEY-STONE. A common blewish Slate, for
colour and substance. But excelleth, in that it rises large
enough for Building. It may be cleft as thin as you please.

A kind of whitish Slate, mixed with a rusly Iron-colour:
plentiful in some Mines.

Some others; one grey and spotted with tawny.
Another, of a brown Purple. A Third, Red. These abound
in the High-Ways about the Mines in *Cornwall*. With these
may be placed.

The WAXEN VEIN. *Ludus Helmontij*. A Stone com-
posed of two distinct Bodies. One, and the far greater, is
of

of a dirty ash-colour : in substance, not unlike the *Limestone*. The other, somewhat harder ; runs through it in several *Veins*, or rather *Plates*, as being usually plain, as thick as the back of a slender *Knife*, and exactly of the colour of yellow Wax ; for which cause I have plac'd it amongst the *Plated Stones*, and taken leave for the *English Name*. Both of these two Bodies make an *Effervescence* with *Spirit of Nitre*, but the ash-colour'd, the greater.

The PIPED WAXEN-VEIN. So I call it, for that the greater ash-colour'd Body inclosed within the yellow *Plates*, is stuffed top full of small *Cylinders* and *Tubes* irregularly placed : most of which seem to be of the same yellowish substance, as the *Plates*. This *Species* hath some affinity with the piped *Osteocolla* above describ'd.

The STARRED WAXEN-VEIN. Given by Sir Rob. Moray. Found in the Isle of *Sheapy*. On one part of the Stone grows a fair Star, with many Rays, about an inch long, white and glossy : from whence I name it. This Star is of a quite different nature from the Stone on which it grows, as making no *Effervescence* with *Acids*, and in figure agreeing rather with the *Pyrites*.

A Piece of WAXEN VEIN, with doubled *Plates* ; in some places, as it were efflorescent with several little protuberances consubstantial.

From the Description of this Stone above given, it appears, that *Wormius* was mistaken, in reckoning it amongst *Flints*. This is that, which *Paracelsus* so much extols for a *Lithontriptick*. And thus far I believe, that 'tis a very good *Diuretick* ; and may therefore sometimes be very well used for the carrying off of *Gravel*. But let all that have any Stone too big to be voided, take heed of such Medicines.

PLATED MARBLE. It seems to have been originally a striated Bole. Now a Stone as hard as Marble, composed of Portions, of an inch thick, ~~all of a group~~ colour'd, growing parallel, or as it were *stratum super stratum* ; from whence I have nam'd, and here plac'd it.

Several soft PLATED STONES, found in the same place, and of the same colour and substance, with the *Fish-Mould* formerly describ'd. One of them, Globular, a little compressed on the two opposite sides : but composed of

of *Plates* or *Crusts* narrowed from the middle of the Stone both ways, so as to make that Figure. A second, Oval, with three Hemispherick knobs appendent; all plated, as the Globular. A fourth and fifth figur'd almost like a Finger.

THUS FAR of *Plated Stones*. Next of those which we may call *Fibrous*. In the former, the Parts are answerable to the leaves in a piece of *Past-board*. In these to the *Bristles* in a *Brush*, or the *Threads* in a *Skeine* of *Silk*.

THRUM-STONE, as I call it. *Amianthus Lapis & Asbestinus*. It grows in short Threads or Thrums, from about a $\frac{1}{4}$ of an inch to an inch in length; parallel, and glossy; as fine, as those small single Threads the *Silk-Worm* spins; and very flexible, like Flax or Tow. Nothing answers it better, than the hard fibrous part of a large *Oyster*, when 'tis stew'd. Here are several pieces, both of White and Green. Of which, the latter hath the longest Threads, and the most flexible.

A piece of AMIANTHUS-ROCK; in which the *Thrums* (about $\frac{1}{4}$ of an inch in length) lie in *Layers* between several Beds of a Green Stone, in some places of a redish brown.

Another, with *Veins* or *Layers* between Beds of a blewish colour.

A BASTARD-AMIANTHUS. It grows in *Veins* in a Clay and Mundick Load, between Beds of a Greenish Earth. The Threads $\frac{1}{3}$ ^d or near $\frac{1}{2}$ an inch long, of a glossy black, and brittle. Given by Mr. *Colepress*, who observ'd it amongst the *Cornish Mines*.

The best is found in *Cyprus* and *India*. Of late, very good in some *Mines* in *Italy*. Of which see the *Philos. Transactions*. (a) It was anciently spun, like *Tow*, into Sheets; (a) Num. 72; in which the Bodies of Princes, laid on the *Funeral Pile*, were wrapped up, to keep them entire, when they were burnt, from the other ashes. These Sheets were made clean; not by washing, but by burning them; as being insuperable by the fire: from whence the Name of the Stone. The Art, as well as the Use, is thought to be gone. But not so; for *Septalius* (b) hath or lately had both *Thread*, (b) Musæum Ropes, *Paper*, and *Netted-Works* all made hereof; and some of them with his own hand. *Boetius* describes (c) an (c) Lib. de Oyntment made of this Stone, which he highly com- Lap. & Gem: mends

mends against the Sore on Childrens Heads, usually called *Tinea Puerorum*; and Ulcers in the Legs. It hath no sense of *Acids*.

The FIBROUS BLOOD-STONE. *Hæmatites*. This I take to be that particularly, by *Pliny* call'd *Androdamas*. It hath affinity with the *Amianthus*, not only in being divisible into *Fibers*; but in that these *Fibers* are also somewhat flexible, and of a greenish colour. Yet here, they stand not just parallel, but rather so as to tend towards one point; like the *Styriæ* in some sorts of *Antimony*. This Stone is also altogether insensible of *Acids*. Found in *Germany*, *Bohemia*, *Silesia*; among the Iron Mines; of an Iron colour, a dull red, yellow, and sometimes black. Much celebrated against an *Hæmoptoe*. *Trallianus* prescribes it ground to an impalpable powder, from \mathfrak{v} to \mathfrak{viii} for a Dose.

(a) In fine,
Cap. de
Amiantho,
&c.

A Piece of SPAUD or TARRAS. *Schistus Capillaris*; as I call it. It consisteth of white, glossy, and parallel *Fibers*. But different from the *Amianthus*, in that they are very brittle; nor so easily divided. From the *Schistus* described by *Wormius*, (a) which is divisible into *Plates*. And that which *Boetius* describes, which is yellow. This is pure white, almost like polish'd Silver, and in a thinner piece, semiperspicious. Being rub'd between ones Fingers, it divides into an infinite number of Hairs, twenty times smaller than the smallest Needle. It stirs not with *Acids*: and therefore seems neither to be any kind of *Gypsum* properly so call'd.

Another Piece of the same, from *Warwickshire*. Given by Sir *John Hoskins*.

A Piece of HARD TARRAS, from *Stinchcombe* in *Gloucestershire*. Given by the same Hand. 'Tis more close and firm than the former, rather like those in *Sal Armoniac*; the *Fibers* not altogether so regularly pild; nor so white, more resembling the *Mother of Green Vitriol*.

The same Analogy as is between *Talk*, *Muscovy-Glass*, and *Amianthus*: is also between the *Rhomboid Spar*, the *Saxum Fissile*, and the *Tarras*.

CHAP. VI.

Of STONES IRREGULAR.

AS GEMS are chiefly distinguished by their Colours, and all other *Stones Regular*, by their Figures: So these, by the different degrees of Hardness.

EMERY. *Smiris*. Of a kind of blackish Iron-colour. The hardest of unfigur'd Stones. And is therefore used for the polishing and cutting of all *Gems*, except the *Diamond*. For the hollowing of flinty Mortars, together with Sand. (a) For the brightening of Armour, and all *Metallick Equipage*. And for Moulds or Forms for the casting of *Medals* and other *Coins*. Yet Mr. Boyle (b) hath open'd it with a Corrosive *Menstruum* so far, as to make an infusion of *Galls* therewith to turn blackish.

(a) Mus.
Metall. Ald.

(b) Of Gems,
p. 160.

A FLINT of the colour of yellow *Amber*. It alludeth to a *Topaz*.

A polish'd FLINT, not unlike a *Calcedony*.

A rough FLINT naturally perforated with several large Cavities running one into another. It seems to be an assay towards an *Eagle-Stone*, which is commonly a *Flint*.

Flints are of all colours. Some so clear, that some *Jewellers* cut and sell them for *Bohemick Diamonds*. (c) They are also used for factitious *Gems*, with the mixture of Metals, in fusion. For making of *Glass*. For Mortars for the powdering of the Fragments of *Gems*. And sometimes added to melted Metals, to keep them, as is supposed, by the *Metalists*, from spending. (d)

(c) Boet. de
Gem.

(d) Ambros.
in Aldrov.
Mus. Metal.

A BALL of SERPENTINE MARBLE; called *Ophites*, from the winding of the Veins. Near four inches in Diameter. Of the noblest sort; consisting of White, and Red or Murrey Veins, in Black.

ANOTHER MARBLE-BALL, two inches and $\frac{1}{2}$ in Diameter, Veined, and spotted with Red, Sand-colour, and White.

A THIRD, Veined and spotted with Black, Sand-colour'd, and White.

A Ball of ONYCHINE MARBLE, about the same bigness; on one side Sand-colour'd, on the other Grey. That which is observable is this, That instead of winding Veins,

it hath feveral Circles one within another, as if drawn with a pair of Compaffes on a *Slate*; or as in the *Onyx*; from whence I have nam'd it.. The bigest Circle is about an inch and $\frac{1}{2}$ in Diametre.

Two pieces of ÆGYPTIAN MARBLE. Consisting of a blackish Ground, as it were inlaid with little Green pieces, most of them of an oblong square Figure.

A Piece of the worst sort of CORNISH MARBLE, used for *Lime*. A blewish Stone, mixed with some whitish sparry Veins; and some of a redish-flat, of the colour of *Terra Lemnia rubra*. Marbles, besides the places mention'd, are found in *Italy*, *Germany*, *Cappadocia*, *Hetruria*, *Numidia*, and other parts. The uses are as known, as great.

LAPIS LAZULI, i.e. Blew-Stone; *Lazuli* being the *Arabick* word for a blew colour. Whence also the corrupt *Italick*, *Azure*. It consisteth of parts of a full Blew (usually with some yellow specks) immerfed in a dull Bed, bordering upon the colour of *Fullers-Earth*. On this here, grow some pieces of *Spar*, so hard as easily to write in *Glass*.

Another Piece growing to an ash-colour'd and softish Stone, dissoluble with *Spirit of Nitre*.

This Stone is usually found in Gold Mines in *Africa* and *Asia*. Of two kinds; The fixed, which being put in to the fire, keeps its colour; The Not fixed, also in *Germany*. (a) Hereof are sometimes made *Knife-Hafts* and *Spoons*. But especially that most excellent BLEW, called *ULTRAMARINE*. The manner of preparing it, is very largely and exactly described by *Boetius*. (b) The powder hereof given to the quantity of 3ß (or more or less) is an innocent and useful *Cathartick*. (c) It will sometimes work by *Vomit*. Hath been successfully used in *Quartans* and *Malignant Feavers*. And yields a *Narcotick Oil*. (d)

The Fading BLEW-STONE. *Lapis Armenius*. This piece consisteth of Blew and Green parts mixed together. And the blew parts themselves, at least, the colour made of them, will in time turn green. 'Tis softer than *Lazuli*, and not insensible of *Acids*; and of *Oil of Vitriol* more, than of *Spirit of Nitre*.

Another Piece of *L. Armenius*; consisting of Blew parts immerfed in a hard and redish sand-colour'd Bed, with a Green piece growing to one side. Given by *Henry Olden-burge*

(a) Boet. de
Lap. & G.

(b) From
Cap. 123.
to 137. &
141.

(c) Bravavolus.

(d) Fioravantus.

burge Esq;. It grows in *Germany, Hungary, and Transylvania*. It makes also an excellent Blew, but, as is abovesaid, not holding. The way of making it, see in *Boetius*. (a) Given in Powder, unwashed, to the quantity of ʒi or ʒiiij, it works by Vomit: washed, to the quantity of ʒv or ʒij, works by Stool; highly celebrated by some, not only for its Innocent, and most easie; but also most effectual Operation, in such Diseases, as are supposed to depend on Melancholy. (b)

(a) Lib. 2. c. 144.

(b) See Tral-
lianus, Guai-
nerius, and
others.

The LOADSTONE. *Magnes*; from *Magnesia*, a Country between *Theffaly* and *Macedonia*, where, it's said, it was first found. For the most part of an Iron-colour, tending to Blew, by some called *The Male*; if Black, *The Female*. Here are several both great and small. One weighing about sixty pounds. Given by Dr. *Edward Cotton*. Dug out of the Ground in *Devonshire*. Although it takes up no great weight, yet moves a Needle nine feet distant. Some part hereof, which was broken off, being put in its proper place, adds much strength to it. Here are likewise some other great Pieces from the same place.

Part of a LOADSTONE ROCK in *Anglesey*. Of a rusty Iron-colour, and in some parts of a dirty flat-Blew.

Two Orbicular LOADSTONES, one of them with an *Axis*.

TWENTY SEVEN Lesser LOADSTONES: whereof eleven are Arm'd and Coated. They are usually found in *Germany, Italy, Misnia, &c.* in the Iron-Mines; and sometimes yield Iron. See the History hereof in *Kircher*, and *Vincent Leodaud*, who have published what is said both by our own Country-man *Gilbert*, and by others.

The admirable and known Properties of this Stone, are, in general, these, That it attracteth Iron; or any Body, if small, which hath Iron in it. That it hath no perception of any other Body, though never so light. That it maketh the Attraction according to its Poles. And that it Communicateth to Iron both the same attractive power; and a Verticity to the *North-Pole*. In which last, lieth its Great use, as applied to *Navigation*. Although by Observations made from the Variation of the Needle, Time may produce further Discoveries in *Astronomy*. Those that travail through the vast Deserts of *Arabia*, have also a Needle and Compass, whereby they direct themselves in their way, as *Mariners at Sea*. (c)

(c) Majoli
The Colloquia.

(a) Mus.
Septal.
(b) Of Ef-
fluv. p. 33.

The power of the *Magnet* dependeth not on its Bulk ; the smaller, being usually the stronger. *Tergazi* (a) mentions one, that would suspend sixty times, and Mr. *Boyle*, (b) another, eighty times, its own weight. But the best, in time loose very much of their strength ; as these here kept have done : None of them now taking up above $\text{3vi}\text{ss}$. Of what they would have done formerly, I find no Register.

Some means have been proposed for preserving the strength of a *Loadstone*. But there is none mentioned by any Author, that I know of, comparable to That, experimented by Mr. *Theodore Haac*, Fellow of the *Royal Society* ; not only for Preserving, but also Recovering, and Encreasing the strength of the *Loadstone*. For he having One weighing about $\text{3iiij}\text{ss}$ arm'd, which would take up sixteen times its own weight : and having laid it by for the space of some years unus'd, found it to have lost $\frac{1}{4}$ th part of its strength, so that it would now take up but about 1biiij . And, upon search, meeting with no means effectual to recover it ; considered with himself, That as in Morals, the exercise of Virtue, makes it more generous ; and that Animal Motions, by use, become more vigorous : so it might possibly prove also as to some Properties of Inanimate Bodies. Whereupon, he hung as much at his Stone, as it would bear ; and so left it for the space of some Weeks. Then, returning to it, and applying more weight to the former, it very easily held the same. And repeating the addition of more weight, at several periods in the space of about two years ; he at last found, That his Stone had not only recovered its former strength, but encreas'd it ; for whereas before he had never known it to take up more than sixteen, it would now take up twenty times its own weight. And he is now continuing the Experiment, to see how far it will go further.

A GRITTY-STONE, from the Forrest of *Dean* ; with which they there make the insides of their Iron Furnaces ; wherein their fire is so vehement, that it either breaks or melts down any other Material. The Grains of the Stone must therefore be insuperable ; yet not so united, but that it is somewhat soft and crumbly : of a dirty colour, near that of *Fullers-Earth*. Given by Sir *John Hoskins*.

ANO-

ANOTHER, from the same Hand, more gritty, harder, and of a brown colour.

A Stone like a pure white *Pebble*, to which another lesser of the same colour, by mediation of a clean Red, and also stony Cement, is affixed. Hard, yet dissoluble with *Acids*.

A little Red Oval Stone, on one side obliquely furrow'd; on the other, pounced, and stained with a stony Blot. This also is hard, yet easily dissolved with *Spirit of Nitre*.

A piece of Soft ALABASTER. *Alabastrites*. 'Tis white and crumbly, an infinite congeries of *Chrystalline* or shining Grains, no bigger than fine sands. It grows in *Warwick-shire*. And is like to that which comes from *Holland*. Given by Sir John Hoskins.

Another piece, from *Shepston* near the *Seaside*.

Another piece of a YELLOW colour, almost like to that of expressed Oil of *Mace*. It hath some of a blewish Clay upon it; but might rather casually fall into such a Bed, than be bred therein.

A FOURTH, of VARIOUS colours, in spots, *sc.* White, Yellow, Red, Leaden, Brown, and Black, mixed together.

A FIFTH (in a Frame) consisting of Ash-colour, Black, and Tawny, mixed in Spots and Veins.

'Tis found also in *Caramania, India*, and other places. It hath been more used than now for the preserving of some more precious Oyntments. But why, rather than Glass or Glased Vessels, I know not, unless for shew. A Scruple hereof given in *Milk*, is affirmed by *Boetius* (a) to be a certain Cure of a *Dysentery*. Yet I would have no man to trust to this, who may have other Remedies.

(a) De Gein.
& Lap. lib. 2:
c. 270.

BASTARD-ALABASTER, spotted. *Gypsum variegatum*. Here are Examples of several Colours. One Black, with white spots. Another, consisting of parts some Black, and some of a pale Green. A Third, of a dark Green, mixed with White and Red Veins and Spots. A Fourth, consisting of White, Brown, and Yellow. A Fifth, of White, Red, and Yellow. A Sixth (in a Frame) of Ash-colour, Citrine, Red, Black, and pellucid Spots. A Seventh, of White, Green, and a dark Purple. All these Stones make a strong *Effervescence* with Nitrous Spirits. They are found in *Misnia, Burgundy, &c.*
Of

Of these lightly burnt, is made that which is properly called *Gypsum*. And *Statues* of any desirable bigness, yet very light.

A LIME-STONE (*Saxum Calcarium*) having greenish Veins mixed with a silver gloss. This being burnt, is that commonly called *Quick-Lime*. *Pliny* mentions a mixture of *Quick-Lime* and *Hogs-Grease*, usually call'd *Maltha*: whence our *English* word *Mortar*. 'Tis also used for the Trying of *Ores*. (a) *Boetius* describes an *Aqua Calcis*, mixed with *Sal Armoniac*, as an admirable Remedy for *Burns*, *Fistulas*, *Cancers*, and *Spots* in the *Eyes*; he adds, and *Spots* in *Cotton-Cloaths*. (b)

(a) See Agri-
cola.

(b) De Lap.
& G. lib. 2.
c. 293.

FLAKED DROPSTONE. *Stalactites Laminatus*. Found in the top of the Hills near *Wooten Underridge* in *Gloucestershire*. In *Aldrovandus* (c) are several of these called *Succi Concreti*.

(c) Musæum
Metallic.

ANOTHER, digged from under the Root of a Tree in *Cre-Forrest*. Given by Dr. *Edward Brown*.

A SPONGY DROPSTONE, of an ash-colour, as the rest.

A piece or two of small *Dropstones* sent from *Pendennis-Castle*: said to to have had a strong scent; but now hath none.

Yellow GREAT-GLIST. *Ammochrysos*, *Boetio*. So call'd, for that it consists of a great number of glossy sparks almost of the colour of Gold, immersed in a gritty Bed. And by *Wormius* and others therefore called *Mica*.

White GREAT-GLIST. *Ammargyros*, as I call it, the sparks in this being of a bright silver-colour.

(d) Fossil.
Nomencl.

Kentman (d) ranketh both these with *Muscovy-Glass*. And 'tis plain, That the said sparks are flaky, and flexible, as that Stone: and is therefore either the same broken to small pieces, in digging for it; or, at least, an assay of Nature towards it. But surely no Metallick Body, as *Wormius* supposeth it; unless he means, that 'tis sometimes found in Metallick Mines.

A Red DAZE, or small GLIST, from *Cornwall*. It differs from the *Mica*, chiefly, in the smallness of the sparks. For they seem to me, to be altogether of the same nature.

A Brown DAZE (from the same place) with an angular Vein of yellow Daze in it; and both mixed with very small

small sparks of a yellowish *Spar*. Of kin to these, seems to be.

A piece of Gold-colour'd Stone, from a Vein of the same, found in digging a Trench in *New England*.

SOAP-STONE. *Steatites*. Given by Dr. *Richard Lower*. Taken from a Rock of the same in *Cornwall*. Somewhat different from that described by *Boetius*. Consisting of parts white, red, purple, and green mixed together, as in *Castile-Soap*; and seeming, like hard *Suet*, greasie to the touch: whence the reason of both the Names. Yet is it not at all dissoluble either in *Oil* or *Water*. Nor in any indifferent Fire; by which it only becomes somewhat harder and whiter. It seems to me to be much of the nature (for substance) of the *Lap. Amianthus*; and that it is the Mother of it.

A softish Dirt-colour'd STONE (*Saxi Limosi Species*) from *Staffordshire*. Of which those *Pots* are there made, wherein they melt their *Glass*.

The Red CAULE (a Stone so call'd about the *Tin Mines* in *Cornwall*) beaten to powder, and made up into a Ball with water. Of a faint red like that of a wither'd *Pink*. Another of a purplish Brown, with black shining sparks.

A base *Slate*, i. e. neither of one colour, nor good Grain.

An ash-colour'd PUMIS STONE. There are also whitish ones; and some Black, as in *Sicily*. Where, and at *Vesuvius*, amongst other places, they are frequently found. The smoothest are, or heretofore were, used by the *Germans* to rub the skin, in their Baths. (a)

(a) Boet. de Gem. & L.

A CYNDER from *Mount Ætna*; of a blackish colour, homogeneous substance, and something metallick. Quite through full of great *Bubbles*. 'Tis ground to a long Oval Figure.

ANOTHER, much more dense, and ponderous like Iron Ore. Given by Sig^r. *Boccone*.

A THIRD, in some part vitrify'd. Of the Burning and Eruptions of this Mountain we have a copious History given us by *J. Alph. Borelli*.

A Vitrify'd CYNDER, taken out of the Ruines of this City by the late general Fire, and kept as a Memorial of it.

SECT. II.

Of METALS.

CHAP. I.

Of GOLD, SILVER, and COPPER.

GOLD ORE of HERNGRUNT, holding Silver. Given by Dr. *Edward Brown*. It consisteth of sparks of a shining Gold-colour, together with some Black ones, alternately immersed in a white and pretty hard Stone.

GOLD ORE of *Chremnitz*. Given by the same Hand. Here are several pieces. One white, and semiperspicuous. Another, blackish, not much unlike some *Flints*. The others, mixed of both. All so hard, as to write upon *Glass*. Yet *Spirit of Nitre* droped on them, in a little while, will sink into them, almost as *Water* into a *Bolus*. Which perhaps may depend upon some invisible Cracks in the *Ore*.

(a) Dr.
Brown's
Travails,
p. 99.
(b) P. 103.
(c) Ib. p. 99.

That with black spots in white, is accounted the best. (a) In an 100 *l.* weight of *Ore*, is contained about 3j of Gold, holding one third part of Silver. (b) In this Mine, sometimes are found pieces of pure (c) *Virgin-Gold*. This, by some, is called *Aurum Obryzum*: qu. *Ophrisum*, like that of *Ophir*. Of several particulars of the Working here, and of separating the *Gold* from the *Ore*, with the Engines, &c. See the forementioned Doctors *Travails*.

GOLDEN SAND, from the River *Tagus*. 'Tis very fine, and ponderous; consisting of Grains of a redish Iron colour mixed with black.

A lump of pure GOLD of the bigness of a *Peas*, melted out of the forementioned sand.

GRAIN GOLD, or Golden Sand from the River *Danuby*. Given by *John Bembe Esq*; taken thence with his own hand. Very fine as the former. Consisting mostly of black Grains, wherewith are mixed some of a pure Gold colour; in the proportion of about one to twenty.

SAND

SAND out of a River near *Conimbria*, in which there are some few sparks of GOLD. Together with a Knob of Gold fus'd out of it. Given by Sir *Robert Southwell*.

Gold hath the least variety of regular figure, in the *Ore*, of any Metal. Because, more solid, and therefore, less wanton, than the rest. 'Tis a rare *Specimen*, mention'd by *Georgius de Sepibus*, (a) which he calls *Aurum Ramefcens*. The (a) Mus. Roman.

Ductility of Gold is admirable: one Grain, in Leaves, is extended to above fifty inches square: and one ounce employ'd in gilding small Hair-Wyre, will be extended to almost an 100 miles in length; as Mr. *Boyle* hath observ'd. (b) (b) Of FF. fluv. p. 13. & 14.

The Uses of Gold for Vessels, Coins, Armour, Garments, &c. are infinite. The Luxury of *Galienus* the Emperour, taught him to powder his Hair with the Dust of Gold. Some Painters, saith *Ambrosinus*, (c) hang plated Gold over (c) Aldrov. Mus. Met. Vinegar, whereby is produced a pure Blew (as *Cerufs* out of Lead) which they prefer before the *Ultramarine*. Of the Art of Refining, see the *Phil. Transactions*, (d)

Chymically manag'd, it is reduced to several forms, called *Aurum Potabile*, *Aurum fulminans*, *A. Vitæ*; as also, *Auri Calx*, *Crocus*, *Sal*, *Sulphur*, *Tinctura*, *Oleum*, *Vitriolum*, *Flos*: of which see *Libavius*, *Crollius*, *Schroder*, and others. One principal use of Gold in Medicine is, for the Correction of *Mercurial Medicines*. The original use of Leaf-Gold in *Electuaries*, and divers other Preparations, was not only for better grace, but from the opinion of its adding Virtue to them. And Plates of Gold, anciently, have been us'd, especially for Children, as an *Amulet*. Which I take to be the true reason, why the Kings of *England* hang a piece of Gold upon those they Touch. (d) N. 142. Communicated by Dr. *Christ. Merret*.

Pure SILVER, naturally BRAINCHED in the Mine. From a Silver-Mine in *Suecia*. Some of the Branches are blackish being tarnished; the rest of a clear silver colour. Some pieces of a white Spar, dissoluble with Spirit of Nitre, stick to them.

A piece of CAPILLARY SILVER, or with smaller Branches, also from the Mine: with a kind of white Rhombick Spar growing to it. *Ferranti Imperato* & *Aldrovandus*, (e) both give an Example of this kind. (e) Mus. Met.

PLATED-SILVER from the Mine. *Argentum nativum Bracteatum*. It lies in thin Plates, of a clear silver colour,

between the Flakes, or in the Grain of a hard white Stone; as the yellow *Plates* in the *Ludus Helmontij*, described in the former *Section*. The several *Plates* are curiously wrought with *Striæ*, which obliquely decussate each other, and make their Impression all along upon the *Stone*. This *Stone* is insensible of *Acids*. In some places, the Silver also lies crude in a black *Ore*.

Pure Native SILVER, FLAKED, or as it were the *Plated* broken into several thin pieces; lying also in the Grain of a white *Spar*, but dissoluble with *Spirit of Nitre*.

Thick PLATED SILVER from the Mine; with a mixture also of Crude *Silver Ore*; both in a white *Stone* dissoluble with *Spirit of Nitre*.

WHITE SILVER ORE, or of a silver-colour, from *Cremnitz* in *Hungary*. There are also some parts of Black *Ore* mixed with it. And some *Cinnabar*; partly of a Scarlet or Vermilion colour, and partly of the *Lapis Hæmatites*. Given by Dr. *Edward Brown*.

Another piece of WHITE SILVER ORE, growing in a white *Stone*, having a blackish cast in some places, with the hardness of a *Gem*.

YELLOW SILVER ORE, or near the colour of *Gold*, from *Kottenberge* in *Bohemia*. 'Tis granulated in a hard white *Stone*. In some parts, also blackish.

ANOTHER Piece, rather of the colour of *Copper*, from the same place. It grows in a hard, black and white *Stone*.

BLEW SILVER ORE, from the *Silver-Mine* of *Berre Ferris*. Not Granulated, but Flaked. In some positions especially, of a curious blew, like that of *Cichory-Flowers*, or some blew *Glass*, but much fairer. Some yellow *Mundick* also, with a piece of Green *Spar*, grow to it on one side.

PURPLE SILVER ORE, with *Cinnabar*.

GREEN SILVER ORE, The colour is somewhat obscure, but lies not only in the surface, but inward parts of the *Ore*. Here are growing to it some of the *Lapis Armenius*, and yellow *Okre*.

BLACK SILVER ORE, for the most part Granulated; from the *Silver-Mine* at *Schemnitz*. Given by Dr. *Edward Brown*. This sort is the best. An 100 l. of *Schemnitz Ore* yields

yields from an Ounce of *Silver* to twenty Ounces. Some hath been found to yield half *Silver*. (a) Most of it holds some *Gold*; the best $\frac{1}{3}$ th part in proportion to the *Silver*. (b)

(a) Dr. Brown's Travels, p. 91.
(b) Ibid. p. 93.]

GROGUNNION ORE; also Black, and Granulated. It holds fifty *lib.* (sterling) *per Tun.*

CUMBSIMLOCK ORE, Black, and most of it Granulated, immerfed in a blackish Stone, disperfed throughout It holds twenty eight *lib.* sterling *per Tun.* This, and some other *Welsh Ores*, given by Sir Rob. Moray.

COGINNIAN ORE, holding fifteen *lib.* sterl. *per Tun.* It runs in *Veins* or *Layers*, rather Grained than Flaked, together with yellow *Mundick*, between two sorts of Beds; one of whitish Clay, the other of brown Stone.

A BLACK and FLAKED SILVER ORE, with some pieces of the *Lapis Hæmatites* growing to it.

ANOTHER Piece FLAKED, from the Forrest of *Cre*, not far from *St. Veit* in *Carinthia*. With some adhering *Cinnabar* of a brown Purple. Given by Dr. Edward Brown.

BLACK FLAKED *S. Ore* from *Freyberge* in *Misnia*. Here are two pieces: one simple; the other, mixed with white *Ore* and *Cinnabar*.

The SCORIUM of the FREYBERGICK *S. Ore*. Porous, of a blackish glossy colour, and brittle: *qu. Vitrum Argenti*.

B. FLAKED *S. Ore* from *Kottenberge*.

B. FLAKED *S. Ore* from *Cummustwith Rock*. It runs in *Veins*, through a blewish Grey Stone, together with a white, hard, and granulated *Spar*. 'Tis also immerfed in Grain, in the Grey Stone. Both the Stones are so hard as to cut *Glass*.

CUMSUMLOCK ORE, holding twenty *li.* sterl. *per Tun.* 'Tis much like to that of *Cummustwith*.

ANOTHER like *Ore* from *CORNWALL*. Given, with several others, by *Sam. Colepres Esq.* It grows together with *Mundick* and green and yellow *Spar*.

Black and small FLAKED *S. Ore*, from the same place. 'Tis immerfed in a *Slate*, with yellow *Mundick*.

A Piece of Bl. FLAKED *S. Ore* growing to a very hard *Spar*, white within, and redish without, and incrustated

crustated with sparry Grains, not much bigger than *Poppy-seeds*.

Another Piece, with Red *Cinnabar* growing to it.

A large Piece of SILVER ORE, with MUNDICK; running between Beds of White, Yellow, and Green *Spar*. The White, so hard as to cut *Glass*: The other two, soft. The *Ore* runs in a *Vein* obliquely, so as to make an Angle. By which, the Underlying or Dipping of a *Load*, may be well conceiv'd.

The Preparations of *Silver*, are made in most of those Forms, as of *Gold*, and described by the same Authors before mention'd. *Goldsmiths* sometimes give a silver-wash to *Copper*, with that which is called *Oleum Lunæ*. *Soder* (from the *Italick*, *Saldatura*) of *Gold* is made of *Silver*, and half as much *Brass*. *Painters* make a pure Blew here-

(a) Ambros.
in Aldrov.
Mus. Metal.
(b) Num. 41.

of with *Sal Armoniac*. (a) Of the *Silver-Mines* in *Mexico*; and the way of separating the *Silver* from the *Ore*, see the *Phil. Transactions*. (b) And of the Art of Refining, *Num.* 142.

Pure CAPILLARY COPPER from the *Mine* at *Hern-grunt*. Given by Dr. *Ed. Brown*. 'Tis very ponderous, the several *Styriæ* or Capillary parts but short, of a redish Golden colour, growing together almost like those of the little *Stone-Moss*.

Another Piece of the same *Species*.

Pure GRANULATED COPPER, from the *Mine*. Of a redish colour, mixed with a sad purple, and some green. Grows to a *Stone*, outwardly of a *Liver-colour*, within Whitish; not very hard. This sort of Native *Copper*, by *Chiocco*, is call'd *Æris Flos verus*. (c)

(c) Mus.
Calceol.

An Iron-Chain and Heart, at least, cover'd with a Crust of pure GRANULATED COPPER; by lying in one of the two Springs in the *Copper-Mine* call'd the *Ziment* in *Hungary*. Given with the next by Dr. *Edward Brown*.

Pure Native COPPER, both CAPILLARY, and GRANULATED, in one piece. The Capillary part, above two inches broad; and surrounded, like a *Wood*, by the other. *Aldrovandus* (d) hath a sort that is pointed, or at least angular; which *Ambrosinus* calls *Æs nativum figuræ pangoniæ*.

(d) Mus.
Metallicum.

BULLATED COPPER, Native, or from the *Mine*. Given by Sir *Rob. Moray*. 'Tis pure and of the colour of the best concocted. Whether this piece was not fluxed by some sub-

subterranean fire may be question'd. Of the rest, 'tis plain to the contrary.

Pure MASSY COPPER from the *Mine*. Given by the same Hand. It grows to a white and semiprecious Spar, which cuts *Glass* easily, and deep.

YELLOW COPPER-ORE, from the *Mine* at *Hern-grunt*. Given by Dr. *E. Brown*. 'Tis of a redish yellow, mixed with some sparks of the colour of *Gold*, both with- (a) P. 108: out and within. It yields ordinarily, $\frac{2}{3}$ th part *Copper*: sometimes $\frac{3}{4}$ th or above half. See his *Travails*. (a)

Another piece of YELLOW COPPER ORE. Given by Mr. *Oldenburg*. 'Tis immersed in small sparks in a brown Stone; to which adhere some very green Flakes of the nature of the *Turcois*.

BLACK COPPER ORE, holding SILVER. There are some Grains of a dark *Purple* mixed with it. Given by Dr. *Brown*.

Another Piece, with some efflorescence of *white Vitriol* upon it; perceived especially by the Taste.

A Third piece, with natural *Verdegriee*.

BLACK COPPER ORE, immersed in a Blackish Stone; which is flaked somewhat like *Lead-Ore*; probably a courser sort of *Cinnabar*. Given by Sir *Rob. Moray*.

Of *Copper*, with the addition of *Calamy*, is made *Brass* with increase, in the proportion of $\frac{1}{3}$ ^d or more, according to the Stone, and manner of operation. Of the making of *Brass*, see *Agricola*.

Of *Copper* are prepared, the *Calx*, *Crocus*, *Quintescens*, *Tincture*, *Oil*, *Vitriol* and *Flowers*. Some of them much, and well used outwardly against ill natur'd *Ulcers*. And also justly to be reckon'd among the best Remedies for the Eyes. That the Labourers in the *Copper-Mines*, have them always good, is an observation of *Macrobius*.

CHAP. II.

Of TIN, LEAD, and IRON.

A Piece of pure TIN, refined in the *Furnace*.

Pure TIN, Native, or from the *Mine*. It lies as it were in bright drops in a brown Stone.

CRUDE TIN powder'd, consisting of shining black and Iron-colour'd Grains.

TIN-ORE, holding *Silver*.

FAT TIN LOAD, of a great Grain, in a blewish Clay. 'Tis a Cluster of *Crystals* like black *Glasses*.

Another piece also very FAT, but smaller Grain'd; consisting rather of sparks.

A SHOAD, a FAT TIN-Stone so call'd; of an Iron colour, with some gloss where it is broken. Very ponderous.

A sort of TIN ORE, with its Grewt. That is, a Congeries of *Crystals* or Sparks of *Spar* of the bigness of *Bay-Salt*, and of a brown shining colour, immersed therein. They are so hard, as to cut *Glasses*.

TIN ORE, consisting of extream small black Sparks or Grains, immersed in a green and yellow Grit.

TIN ORE, of an *Okre* colour, with a mixture of black shining Sparks.

A *Specimen* of GRAIN-TIN ORE of several colours; *sc.* blackish, brownish, purplish, redish, and yellow. So good, that they need little or no preparation, by stamping or dressing for blowing: neither is there any considerable wast in the melting.

A SLAG, remaining in the bottom of the *Tin-Floate*. Sent by Mr. *Coleprests*. Of a bright colour next to *Silver*. Yet contains (saith he, mostly) Iron; which he accidentally perceiv'd, by applying the *Magnet* to it, both quickly uniting. But note, that now, at least, they will not, unless you take small Sparks only, and these will leap up to it. He also saith, That one Dr. *Stall* a German *Chymist*, affirmed, the *Dutchmen* make good *spelter* of it.

SCUM taken from melted TIN. Of a blackish brown, with

with some sparks of Metal. It seems near as heavy as the pure *Tin* it self.

CHIMNEY-TIN, forced up from the Herd. 'Tis black shining and heavy; almost like very fine black sand.

A *Metalline Slat* from the *Tin-Mines*.

See a large Account of the *Tin-Mines* of *Cornwall* and *Devonshire*, in the *Phil. Transactions*; (a) communicated by a Person much conversant among them. As also another accurate one particularly of those in *Cornwall*; communicated by Dr. *Christopher Menet*, and by Me published in the said *Transactions*. (b)

(a) Num. 69
(b) Num.

Tin is mixed with *Copper*, in the making of Metal for *Bells*, *Organ-Pipes*, &c. the proportion of *Tin* to *Copper*, as two to seven, or thereabout. If under, it will be too soft; if over, too brittle. The Metal used for *Concaves* and *Speculums*, is likewise a Mixture of *Tin* and *Copper*. Of *Tin*, with *Lead*, and the *Marchasite* of *Antimony* of each $\frac{1}{4}$ th part, is made one sort of *Printing Letters*. Of this Metal is made that sort of *Ceruss*, called *Spanish White*; one of the best, used either by *Painters*, or by *Women*. *Stannum ustum*, the best preservative of the polish of *Metallick Concaves*, and the like. *Riverius* (c) highly commends his *Bezoardicum Jovis* against *Malignant Feavers*. A Mixture against the *Bitings* of *Mad Dogs*, consisting chiefly of *Mithridate* and the *Filings* of *Tin*, is much used and relied upon by some *Huntsmen*.

(c) Observ.
Cent. 4.
Obs. 56.

CRYSTALLINE LEAD, from the *Mine*. So I call it, not that it is clear, but consisteth for the most part of *Hexagonal Points*. Of the bigness of a midling *Apple*.

LEAD ORE, rich in *SILVER*. Given by Sir *R. Moray*. 'Tis of the usual colour, but mixed with white *Spar*, so hard as to cut *Glass*. And I suppose, that most *Lead Ores* with such a *Spar*, have *Silver* in them.

LEAD ORE holding *SILVER*, and growing together with *Iron Ore*.

LEAD ORE, probably also holding *Silver*. It lies in a whitish *Spar*, which is not so flaky as is usual, and will cut *Glass*.

LEAD ORE holding *SILVER*, with a large *Crystalline Spar* consisting chiefly of *Hexagonal Points*, and of the

U u

colour

colour of a *Calcedony*. *Ferrant. Imperato* hath one which he entitles *Ingemmamento di Piombo*; and seems to be like this.

SPARKS of LEAD ORE in the *Caulk*. One of the Sparks is branched almost like a small Leaf. The Stone or *Caulk* is a Congeries of white *Crystals* of *Spar* laid cross every way. They will cut *Glass*.

A large piece of LEAD ORE, flaky, and lying in spots in a white perspicuous, flaked, and soft *Spar*.

Some other pieces of *Lead Ore, English*.

LEAD ORE, from *Freiungen*, called *WEISSER FLIES*. It consisteth of a soft and friable *Spar*, of a pale colour, near that of the *Diaphanous* natural *Sulphur*; together with a redish substance intermixt.

LEAD ORE, from the same place, called *Schlich*. 'Tis a fine grey Sand, like that used for Writings: with some few black Grains; which is, I suppose, the true *Ore*.

A large piece of LITHARGE (of *Silver*.)

See a large and accurate Account of the *Mendip Lead Mines* in the *Phil. Transactions*; (a) communicated by Dr. *Jos. Glanville*.

Lead (besides the uses commonly known) is also employed for the Refining of *Gold* and *Silver* by the *Cupel*. Hereof is made common *Ceruss* with *Vinegar*. The way briefly, yet perspicuously set down by *Theophrastus*. (b) Of *Ceruss*, *Red Lead*. Of *Plumbum ustum*, the best yellow *Ochre*. Of *Lead* and $\frac{1}{2}$ as much *Tin*, *Solder* for *Lead*. Hereof are also made the like Chymical Preparations, as of other Metals, as the *Oil*, *Tincture*, *Salt*, &c. Some of which, many bold *Chymists*, without Discretion, give inwardly, and also extol them. But those that are careful of their Health, will beware of them. I do not deny, but that 'tis possible this Metal, as well as *Mercury*, may be so order'd and given, as to be innoxious.

BRUSH-IRON, Native or from the *Mine*. It consisteth of strait, round, long *Styræ*, about the thickness of a small *Kniting-Pin*, bolt upright, like the *Bristles* of a stiff *Brush*, or the *Teeth* of a *Wooll-Comb*. They grow on a double-Bed, the uppermost of an Iron-colour, the undermost of a dark yellowish red.

BRUSH ORE; From *Doward* in *Herefordshire*. Given by

(e) Num. 28.
& 39.

(b) Lib. de
Lap.

by Sir *John Hoskins*. A rich sort. It consisteth also of strait and almost parallel *Styriæ*, most of them as thick as a strong *Knitting-Pin*; incrustated with very small Grains of *Spar*, of the colour and bigness of the Corns of *Bay-Salt*, but very soft.

MIXED BRUSH ORE; from *Clower-Wall* in the Forest of *Dean*. By the same Hand. It consisteth of several *Piles* of round and parallel *Styriæ*, and *Layers* of unfigur'd Ore, a *Pile* of the one, and a *Layer* of the other, cross-ways; seven or eight in this piece, within the extent of betwixt four and five inches.

A piece of IRON ORE, from *Doward*, of kin to the former. By the same Hand. 'Tis rich, yet hath only some few *Styriæ*.

ANOTHER piece, from the same place, and by the same Hand. In this the *Styriæ*, or figur'd pieces, are flat, and irregularly cluster'd. *Aldrovandus* (a) gives the figure of an Iron Spar (Ore) ramify'd. (a) Mus. Me- tall.

A piece of RICH IRON ORE, from a Hill of the same in *Wiltshire*, upon which is situate a Village called *Seen* or *Send*, about nine miles from the *Bath*. Given by *J. Aubrey Esq.* Who saith, It is so good, that the *Smith* there can make that which he takes up in the street, to melt in his Forge; which that in the *Forrest of Dean* will not do.

The same Person observing there was great abundance of it, conjectur'd, it might Impregnate some Neighbouring Spring. And upon trial, found one, amongst others, in the middle of the street very strong, beyond that of *Tunbridge*. For upon the affusion of a *Tincture* of *Galls*, it immediately became as black as *Ink*. The Village is well built, and standing so near the *Bath*, may be very convenient for those who drink *Chalybate Waters*, either before or after they go thither. Mention also is made of this place by *Dr. Christopher Merret*. (b) (b) I think in his *Pinax*

MIXED IRON ORE, from *Doward* in *Herefordshire*. Given by Sir *John Hoskins*. It consisteth of four or five substances. The best part, both brown and red, or brick-colour'd. Wherewith is mixed a white and soft spar. With a blackish, shining, and crumbly Body, knobbed on the top, after the manner of the *Turcois*.

Ordinary IRON ORE, from *Clower-Wall*. By the same

Hand. Almost of a Brick-colour, or that of the *Colcothar* of *Vitriol*.

IRON BALLS, about the bigness of *Musquet Bullets*. Made by the rowling of Iron-Sand off the Banks among the *Iron-Mines* near *Senneck*, especially after rain.

TWO BONES, (part of a Mans Foot) turn'd into Iron-Stone.

A Piece of *Drop-Stone* turn'd to Iron.

An IRON ORE rising near the *Silver-Mines* (in *Wales*.) In some parts of a brown *Cinnabar*-colour, and mixed with *Slate*. The *Loadstone* takes up little Corns of it no bigger than Sand.

An odd IRON ORE, scarce fixable. In a white *Spar*, almost like a *Calcedony*, hard enough to cut *Glass*.

A sort of BLACK CAULE, holding IRON. Yet so little, that the *Loadstone* will not take up any part of it, bigger than *Pins head*. It hath a black, shining, and very cross Grain; with white *Spar* interspers'd, which cuts *Glass*.

Another IRON-SPAR, consisting of little white and umber-colour'd Columns, laid together cross-ways.

An IRON BODY, that rubs away in glossy Dust; with part of its Wall, (a brown *Spar*) in which it lay inclos'd.

A Piece of the OLD CYNDER, which now they use as a Flux for the *Iron Ore*; somewhat bubly. From the *Iron-Mines* in *Monmouth*.

Another, from the *Forrest of Dean*, by Sir *John Hoskins*. 'Tis run into *Styriæ*, somewhat like those of *Ice*, brittle, ponderous, opacous, glossy, and of the colour of the coarsest sort of *Crocus Metallorum*.

A Vitrify'd *Cynder*, of no use; like a piece of coarse green *Glass*.

An IRON STONE, with a *Spar*, on one side, consisting of pellucid squares; on the other, of white flakes set cross-ways, almost at right Angles one against another.

A Piece of RUSMA or crude *Zernick*, almost of the colour of *Crocus Metallorum*, or some sorts of the *Hæmatites*. Given by Mr. *Lannoy*, a *Consul* at *Smyrna*.

See a very good Account of the *Iron-Mines*, and *Iron-Works* in the *Forrest of Dean*. Communicated by *Henry Powle Esq*; and by Me published in the *Philosoph. Transactions*.

actions. (a) Some of the ways of giving a due Temper to Iron, according to the use made of it, are set down by *Ambrosinus*. (b) For one Temper is requir'd for drawing it into Wyre; another, for a *File*; another, for a *Chisel*; another, for a *Sword*; another, for the *Edge* of a *Sword* in particular; and the like. For the hardening of Iron for *Files*; one of the Kings *Farriers*, upon my enquiry, commendeth this following way.

Take *Horse Hoofs* or *Rams Horns*, and hang them over the fire till they drop like *Glew*. Take also pieces of *Leather*, and burn them black. Powder them both, and put to them stale *Urine*, and *Bay-Salt*. Let them stand together; the longer the better: at three or seven years end it will be excellent. Case the *Iron* with this Mixture, and give it a strong heat, sufficient to fuse the Mixture, for three hours; and then cool it. The surface of this *Iron* will be as hard as the hardest *Steel*, and will make excellent *Files*: but the hardening reaches not to the heart of the *Iron*.

Of *Rusma* (a brown and light Iron substance) with $\frac{1}{2}$ as much *Quick Lime* steeped together in Water, the *Turkish Women* make their *Psilothron*, to take off their Hair where-fover they please. There are many Medicinal Preparations of *Iron* or *Steel*: But none, that I know of, equal to the *Tincture* made without *Acids*; especially in Obstructions, and to strengthen the Tone of the parts, as in *Lienterick*, and other like Cases. Against all outward and inward *Hæmorrhages*, *Quercetan* highly extols his *Oleum Martis*. A *Tincture* of *Steel* made with *White Wine*, saith *Ambrosinus*, (c) is a strong *Cathartick*. What he means, I know not. Perhaps he might find some such effect upon himself, from that, as one I know in this City, doth from *Mithridate*, which commonly gives him a Stool extraordinary. And another, upon whom *Marmalad* hath the like effect.

CHAP. III.

Of ANTIMONY, MERCURY, and other
METALLICK BODIES.

STYRIATED ANTIMONY, from the *Gold Mines* of *Chremnitz*. Given by *Dr. E. Brown*. The *Styriæ*, in this, are very fair, many of them as thick as in that which is factitious.

(a) Mus. Met. STYRIATED ANTIMONY, also Native, from *Cornwall*; called *ROSCARROCKS*. A Congeries of strait, long, slender, and edged *Styriæ*, of a bright Steel-colour, almost like a cluster of small broken *Needles*. *Aldrovandus* (a) hath a sort of native *Antimony*, which *Ambrosinus* calls *Plumosum*.

GRAINED ANTIMONY, or rather *Antimonial Ore*, from *Hungary*. Given by *Mr. Oldenburge*. It looks like black grained *Silver Ore*. Immersed in a Stone, although of a scurvy opacous and sandy colour, yet so hard as to cut *Glass*.

ANTIMONIAL ORE from *Transylvania*. Given by *Dr. E. Brown*. It grows in a soft Bed, almost like *Lead Ore*.

ANTIMONIAL ORE, holding Iron, from *Cornwall*. Almost of the colour of *Amber*: yet with a Grain somewhat glossy and very cross.

A Metallick (probably an ANTIMONIAL) *Cornish Stone*, black, hard, and ponderous. It consisteth of a great many Clusters of short glossy *Styriæ*, radiated almost as in the *Belemnites*. But because irregularly broken and heaped together, but difficulty observ'd.

(b) Num. Antimony is of excellent use for the Refining of *Gold*: see an accurate Process, communicated by *Dr. Jonathan Godard*, and by Me published in the *Philosph. Transactions*. (b) An $\frac{1}{8}$ th part in proportion to the *Copper*, is by some added with the *Tin*, for the best *Metallick Speculums*. *Founders* add a little to their *Bell-Metal*, to make it more sonorous. And so *Pewterers*, to their *Pewter*, to make it sound more clear like *Silver*. 'Tis also used in the casting of *Iron Bullets*, to make the Metal run the better. The

Spanish

Spanish Women rub their Eye-brows with it, to give them an acceptable Black. (a)

The Cathartick Property of Antimony, was first taken notice of by Paracelsus. And several Preparations hereof both Cathartick, and Diaphoretick, are now much celebrated. Of the Virtue of it also taken Crude, see the Phil. Transact. (b) The Red Oil, called Stibij Sanguis, admirable in Malignant Ulcers. (c)

(a) Ambrosinus, and others.

(b) N. 39.

(c) Wecker.

MERCURIAL ORE. Given by Mr. Oldenburge. 'Tis all of one colour, much like that of the Hepatick Cinna-*bar*, but somewhat sadder. In the West-Indies, all their silver is refined, or else melted down with Quick-silver. (e) A Past made hereof with Gold, is sometimes used for gilding of Brass Vessels; which being daub'd with the same, and held to the fire, the Gold adheres, and the Mercury exhales. With this the Tin-Foile is made to stick close to the backsides of Looking-Glasses. Of Sublimate, Ceruss, Juyce of Limons, and Rose-water, mixed like an Oyntment; is made That Paint, which is both the best and the worst in the World.

Dr. Popes account of the Mines.

(e) Kirch. Hist. Ind. l. 4. c. 3.

In Medicine, the great use of Mercury is in the Lues Venerea; sometimes in the Cholick and Iliac Passion; and for Wormes, especially those small ones, called Ascarides; against which, if duly prepar'd, there is no Medicine so effectual, or more safe. Being prepar'd, and mixed with convenient Catharticks, 'tis also very properly us'd in divers Chronick Diseases.

A rich piece of Native CINNABAR, from Carinthia. It weighs above 3ij and 3ij, and is entirely of a Scarlet colour.

Another Piece of CINNABAR, of a Scarlet-colour, from Tyrol.

A Piece of Native CINNABAR, of a purple colour, almost like that of fine Lake. Given by Mr. Oldenburge.

A piece of BLACK CINNABAR. Given by Dr. Walter Pope. Hard and ponderous, about as big as a Lambs Heart. Where it breaks, of a shining black.

Another piece, of a shining Black, mixed with a sad Purple. By the same Hand.

The best Cinnabar in the Schemnitz Mines, ground with Oil,

(a) Dr.
Brown's
Trav. p. 91.

Oil, makes a *Vermillion*, equal to, if not surpassing, that made by sublimation. (a)

YELLOW MUNDICK. *Marchasita. Pyrites Aureus*; not for that it hath any *Gold* in it, but is both within, and without, of a shining Metallick yellow. As heavy, as most *Ores*. Here are of various Figures; as

The ORBICULAR MARCHASITE; tubercled, about the bigness of *Hand-Ball*.

Another, lesser, and a little compressed.

The GRAP-MARCHASITE. *March. Botryidea*. It consisteth of small *Globules* growing together in the form of a young Bunch of *Grapes*. There is one like this in *Ferr. Imperato*.

The APPLE MARCHASITE, as it may be call'd. 'Tis round, excepting on one side, where it falls in, and hath a stalk, like a young *Apple*.

The FLORID MARCHASITE. So I name it. For it looks like a Cluster of Buds ready to flower.

The YELLOW BUD. *Marchasita Phylloidea*. For it looks like a single Bud composed of several small leaves.

Part of a CYLINDRICK MARCHASITE, radiated from a Vitriolick *Pith* or *Centre*.

The TABULATED MARCHASITE. Broad and plain, or flat like a *Tablet*. Consisting of flaked and small Cubick knobs, growing on a rough Stone.

Another, only Flaked, growing to a blackish Stone.

A Third flaked, but of an irregular form.

The GRANULATED MARCHASITE. It grows on a brown Stone, in a Crust of about $\frac{1}{12}$ th of an inch thick, with the surface all over grained. This kind is found near *Hindon* in *Middlesex*.

Not only the greater Flakes of which the other Varieties consist, but even the smallest and almost invisible Grains, are all either *Squares*, or at least pointed with *Right Angles*. Whereas the *Pyrites*, simply so call'd, is always Radiated. Which, and not the colour, according to others, I take to be the principal difference between them.

The CUBICK *Marchasite*, about $\frac{1}{4}$ d of an inch square. The *Marchasite* seems to attain the perfection of its Figure, in a *Cube*; that is, a Square upon a Square. But sometimes it consisteth of parts neither *Cubick* nor *Square*; as in

The

The PENTAGONATE *Marchasite*. About the bigness of a little *Gall*; somewhat round, defined with several sides, each with five Angles.

A Tuberated *Marchasite* with a Green *Spar*.

A MARCHASITE growing to its own *Spar*, together with a white one pointed and semiperspicuous.

A Mixed MARCHASITE. It consisteth of yellow pieces partly cubick, and partly flaked: with *Lead-Ore* holding *Silver* growing to it on one side; on the other, several sets of ash-colour'd Flakes growing together in the form of little *Roses*.

As all *Metals*, so *Marchasites* have their SPARS, called *Fluores*. Both because they melt in the fire; and make the *Ores* to which they belong, to melt the better. The reason whereof is, For that in all *Spars*, there is a certain *Salt* which lies more loose and open, and which in mixing with the *Ore*, frets and tears it all to pieces.

A Piece of WHITE MUNDICK.

WHITE MUNDICK ORE, immersed in Grains in an ash-colour'd *Stone*.

GREEN MUNDICK, or *Mundick Ore*, running in Veins in white Clay.

A large sphaerical and knobbed FIRE-STONE, or *Pyrites*, about two inches in Diametre.

Another, of the same Figure, as big as a *Walnut*, and of an Iron-colour.

A Piece of a large one of the same Figure, and with a black surface. The whole Body is radiated from a Vitriolick Centre or *Pith* about $\frac{1}{4}$ of an inch in Diametre. Which radiation is also seen in most *Fire-stones*.

Another whole of the same form, a little lesser.

A Round PYRITES, compressed. Another lesser.

A PYRITES, partly Cylindrick, and partly Oval; *Cylindrovalis*. 'Tis two inches long, and near an inch and $\frac{1}{2}$ over; Cylindrick in the middle, and Oval at both ends. The Surface, smooth, and of a shining black.

MUNDICK ORE, as it may be call'd; having the same Analogy to that which is figur'd; as the *Ores* of *Metals*, have to such as are pure and perfect. This is for the most part of a greenish ash-colour, not very hard, and somewhat gritty.

Yellow *Mundick* GRAIN-ORE; immersed in a *Spar* of an *Amethystine* colour.

Another sort, like Silver Grain-Ore, in a *Spar* of the colour of that of *Tin*. So hard as to cut *Glass*.

A piece of *Mundick-Ore* in a white *Spar*, both Grained and Vein'd.

A piece or two of Veined *Ore* from a *Silver-Mine*.

Mundick Ore and *Vitriol* mixed with a White and Green *Spar*.

Mundick Ore, and *Black Daze*, mixed with a Vein of White and Green *Spar*; all lying between two firm Beds or Walls. These *Ores*, by some are called *Mock-Ores*.

A MOCK-FIRE-STONE. *Pyrites stirilis*. Outwardly, of the colour of polish'd *Steel*. And radiated from the Centre, as the true *Pyrites*. But of a light and useless substance.

No sort of *Mundick*, that I find, either in the *Ore*, or perfect, stirreth with *Acids*. Every Metal hath its *Marchasite*: which is sometimes added to them, instead of *Lead*, (a) to make them flow the better. But if too much, it robs them, by over volatilizing them (b) in the Furnace. Out of most *Fire-stones*, may be made both *Vitriol* and *Sulphur*.

(a) [Boet. de Lapid. l. 2.

(b) Dr. Brown's Travails.

SECT. III.

Of Mineral Principles.

BY *Mineral Principles*, I mean, neither such imaginary ones as some have talked of: nor such as may possibly have a real existence, yet were never seen solitary or uncompounded: but those which come within the cognizance of sense, *sc.* *Salt*, *Sulphurs*, and *Earths*; and such Bodies as are reduceable to these *Tribes*. For it seemeth to me, That most subterranean Bodies are either compounded of these Three, or are hereinto resolved. So *Copperas* is the salt of a Metal; either as an ingredient in its Generation; or resulting from its Corrosion by some Natural *Menstruum*, equivalent to such as are applied by Art. In like manner, a *Bolus*, as it seems to be the Basis of most Stones and Metals; so,

so, upon the Resolution of the same, to be nothing but their *Caput mortuum*. There being a Circulation amongst *Minerals*, as amongst *Plants* and *Animals*; the same Principles passing from one to another. And so, probably, amongst all Bodies, at least between the *Atmosphere* and the Centre of the Earth.

CHAP. I.
Of SALT S.

A Parcel of NATURAL SAL ARMONIAC. (Rather *Ammoniac*, from its supposed similitude to that of the *Ancients*, bred under the *Sands* in *Africa*.) This I call *Natural*, as being found sublimed, by the subterranean Fire, in a *Cole-Mine* near *New-Castle upon Tyne*. Given by Dr. *L. Hodgson*, who first made experiment of the nature hereof. And hath answer'd several *Quæries* about it, proposed by Mr. *Boyle*. (a) Here is some of it lying upon and between Beds of a light and footy Earth; and some pure and white as *Sow*. It hath the perfect Taste of the Factitious; consisteth of the like Fibers or *Styræ*; and may be easily sublimed into Flowers. (b) *Cerutus* hath also described a *Sal Ammoniac*, as he calls it, sublimed by the subterranean Fires of *Puteoli*; but This is of a different kind, as appears from his Description of it. (c) Hereof are made several Preparations of great Use to *Physitians*, *Alchymists*, and others, as the *Spirit Simple*, *Aromatiz'd*, and *Tinctur'd*; the *Tinctur'd Flowers*, &c.

(a) See Phil. Trans. N. 130.

(b) See Part 4.

(c) Mus. Calceol. S. 2. p. 149.

A parcel of SALT taken from *Tenarisse*, 1674. and given by Dr. *George Trumbal*. 'Tis very white, and light like flowers of *Sal Ammoniac*, or the Earth call'd *Agaricum Minerale*. Taken by some to be a kind of *Nitre*. But not rightly. For it hath the perfect Taste of a Lixivial Salt. Makes an *Effervescence* with *Aqua Fortis*, as those Salts will, but *Nitre* will not do. Hath, as those, a fixed Body: neither will it flow, or flame, though expos'd naked to the same fire, wherein *Nitre* will do both. Yet hath it somewhat of a nitrous Taste intermixed; as have also many Lixivial Salts. I conclude it therefore to be a fixed *Alkaly*, or, in nature, a kind of Lixivial Salt.

Another parcel of the same sort of SALT, taken out of the Cave or the Pique of *Tenariffe*, 1674. by the same Hand. Different from the former, only in being of a purer white.

A Third parcel of the same, taken, I suppose, from another quarter of the said Mountain.

A square piece of Crystalline *Sal Gemmæ* (rather *Gemmeus*) weighing almost twenty Ounces.

A Ball of Crystalline *Sal Gemmeus*; with another piece of the same Species.

A piece of styriated *Sal Gemmeus*, tinctur'd with some Rays of yellow. It grows almost in the form of *Sal Ammoniack*.

A piece of styriated *Sal Gemmeus* tinctur'd with partly an *Amethystine*, partly a Saphirine Blew.

Ambrosinus gives a Figure of *Crystal* of this Salt, much like that of the Corns of common Sea-Salt; from which it differs no more, than Pit-Salt.

Sal Fossilis properly so call'd, is, as it were, the *Ore* of the *Sal Gemmeus*. Yet This, as well as Metals, is sometimes found native. The principal *Mines* are in *Poland* and *Calabria*: of which, see a Relation in the *Phil. Transactions*.^(a)

(a) N. 61.
(b) Descript.
Polan. lib. I.

In the lesser *Poland*, saith *Comer*,^(b) are some pieces of this Salt (he means the *Ore*) like huge Stones; so hard, that Houses and even whole Towns are built with them. Near *Eperies*, a City in *Upper-Hungary*, is a *Salt-Mine*, in which are pieces Ten thousand pounds weight. ^(c)

(c) Dr.
Brown's
Travails,
p. 112.

Of This as of common Salt, may be distill'd that *Acid* Liquor commonly, but absurdly call'd the *Oil*. This moderately taken, but especially if it be dulcify'd by Cohobations with a simple, or rather with an aromatiz'd Spirit of Wine, is sometimes of excellent use to restore the Digestive Faculty to the Stomach. But the common sort, taken, as it often is, without discretion, really breeds more Diseases, than it pretends to cure. See several Preparations of Salt in *Schroder* and others. *Ambrosinus*, I think it is, who reports,

(d) Aldrov.
Mus. Metal.

^(d) That in the Province of *Canicla*, in the *Great Cam's* Dominions, the people melt and cast Salt into a round Form, for Money. But who ever knows the nature of common Salt, must also, that this Report is a great mistake.

BLEW

BLEW VITRIOL, Native, and crySTALLIZ'd, from the *Copper-Mines* of *Herngrundt* in *Hungary*. Given by Dr. *Edward Brown*, together with the several *Species* following.

GREEN VITRIOL, Native; from the *Silver-Mines* of *Schemnitz* in *Hungary*.

Native GREEN VITRIOL, mixed with some Rays of a pale Blew; from the same place. With its astringent and sweetish Tasts, is joyn'd some Acritude. It grows to its own Ore, of a purplish ash-colour; and of a milder Tast.

A parcel of the same *Species*, from the *Copper-Mine* of *Herngrundt*.

Native VITRIOL of a pale Purple, and consisting of pointed *Crystals*. This also hath some Acritude. From the same Mine.

Native WHITE VITRIOL. It grows in glossy Grains like *Nitre* grossly powder'd; and not without some Acritude. From the same place.

Made WHITE-VITRIOL of *Chremnitz*.

WHITE-VITRIOL Ore of *Chremnitz*. Of a pale Okre colour, and meanly astringent.

A sort of Native VERDEGRIESE, from the *Copper-Mines* of *Herngrundt*. It consisteth of flat and parallel Plates, as in a *Slate*; of a blewish Green, yet not so blew, as the factitious. 'Tis also of a much milder Tast. It maketh a strong ebullition with *Spirit of Nitre*. These from the above-mention'd Person.

A rich ORE of Green *Copperas*, from *Cornwall*. Of a kind of Brick-colour, crack'd a little with lying in the Air, and hath upon it several efflorescent lumps of *Copperas*.

A poorer sort of Green *Copperas* ORE. On one side, being scraped, of a blewish ash-colour; and with little Tast. On the other, of a yellowish Green, and tasteth strong as *Vitriol*. Maketh an *Effervescence* with *Spirit of Nitre*.

A Fibrous or STYRIATED ORE of Green *Copperas*. 'Tis white, and form'd almost like *Sal Ammoniac*; but hath the perfect Tast of Green *Vitriol*. *Acids* stir it not.

Besides the places mention'd, and others, Green *Copperas* is plentifully made here in *England*, as at *Debtford*, and else where. The *Copperas* Stones, or Fire-Stones are found on the *Sea-shore* in *Essex*, *Hampshire*, and so Westward; the best of a bright Silver-colour. For the making of *Copperas*,
they

they make Beds sometimes an hundred feet long, and fifteen broad at top; well ram'd first with *Clay*, and then with *Chalk*. In these Beds the said Stones are laid about two feet thick: which by *Sun* and *Rain*, are gradually dissolv'd; and in five or six years time, begin to turn into a kind of *Vitriolick Earth*, which will swell and ferment like leavened-Dough. And once in four years, the Bed is renewed with fresh Stones. In a Boyler containing about twelve Tuns of *Vitriolick Liquor* running from the Bed, they put in by degrees, about fifteen hundred pounds of old Iron; which both quickens the boyling, and prevents the setting and melting of the *Copperas* at the bottom of the Boyler, and of the Boyler it self. Sometimes, in stirring the Earth on the Beds, they find pieces of *Native Copperas*. See a particular and exact account of these Works at *Debtford*, communicated by Mr. *Colwal*, the Founder of this *Museum*, and by Me published in the *Philosophical Transactions*. (a) Of the Nature of *Vitriol*, see several considerable Observations grounded on Experiment, in the same *Transactions*. (b) Amongst other particulars, an excellent way of purifying it from its Okre.

(a) N. 142.

(b) N. 103.
& 104.

The three principal Parts hereof are, an *Acid Spirit*, fixed *Salt*, and *Sulphur*. The last, a good *Hypnotick*, in some Cases, where *Opium* is not safe.

(c) Aldrov.
Mus. Met.

Native Vitriol, saith *Ambrosinus*, (c) given to the quantity of 3j in any convenient vehicle, is a great Remedy in *Germany* and *Hungary* for the *Plague*. Blew *Vitriol* of excellent use against *Venereal Ulcers*. Both of this, and the *Green*, is made the Powder called *Sympathetick*; the Description whereof may be seen in *Papinius*, and out of him in *Wormius*. I doubt not, but that the *Stiptick Liquors* of Mr. *Lyster* and of Mr. *Deny*, are both made of *Vitriol*.

A sort of *ALUMINOUS Earth*, found near the River *Patomach* in *Virginia*. 'Tis soft and very light; of an ash-colour, and acid-astringent Taste, almost like that of *Alum*. Whether the people there make *Alum* of it, or use it in *Dyeing*, we have no account.

Of the Nature of *Alum*, see a very good Discourse in the *Philosophical Transactions*. (d) Of the *English Alum-Works* an accurate Account, communicated by Daniel *Colwal Esq*; and by Me published in the same *Transactions*. (e) The

(d) N. 103.
and conti-
nu'd, N. 104.(e) Num.
242.

The *Alum-Stone* (of a blackish colour, and flaky, like *Cornish Slate*) is found in most of the Hills between *Scarborough* and the *River of Tees* in *York-shire*. As also near *Preston* in *Lancashire*. Of these Stones calcin'd, is made a *Lee*; and of the *Lee*, *Alum*. The *Lee* after the first shooting of the *Alum*; is called *Mothers*. In which, certain Nitrous and other parts call'd *Slam*, being predominant; to precipitate the same, they add the *Lees* of *Kelp*; made of *Tangle*, a Sea-Weed commonly among *Oysters*. And then, a certain proportion of *Urine*, both for the same purpose, and to keep the *Kelp-Lees* from hardening the *Alum* too much. The *Mine*, before it is calcin'd, being exposed to the Air, will moulder in pieces, and yield a Liquor whereof *Copperas* may be made.

Fallopius's Aq. Aluminis Magistralis, is of good use against untoward *Ulcers*. *Deyers* boil their *Cloaths*, or *Yarn* in *Alum-Water*, that they may take both a better, and more durable colour. It is used, likewise, for the making of a Leather soft and white, or fit to take a clear colour, which the Tan'd, will not do. And I little doubt, but that to wash the Skins of Beasts or Fowls herewith on both sides, or perhaps on the Feathers, only strewing *Alum* in fine powder, would be a good way to keep them from the *Moth*, and growing dank in moist Weather, and so to preserve them for ever.

CHAP. II.

Of SULPHURS.

A Piece of Opacous yellow AMBER half a foot long. Given by *Thomas Henshaw Esq;* Found, with several lesser pieces, in digging of a Ditch under the Walls of *Rensburge* in *Holstein*, eighteen feet under ground. Which place is at least five and twenty miles both from the *Baltick* and *German Seas*.

A Piece of AMBER of the colour of *Honey*.

A Piece of clear yellow AMBER. Given by Captain *Tailor*.

Another yellow Piece, semiperspicuous; from the same Hand.

A Ball of yellow and opacous AMBER.

A Piece of clear yellow Amber, with a *CICADA* drowned in it.

A Piece of Citrine Amber, with several GNATS immersed.

A little Ball of citrine Amber, with an immersed *Emmet*.

A Heart of yellow Amber, with two FLIES.

Two or three more Pieces, with some other INSECTS.

(a) De Gem.
lib. 2.

In *Septalius's Musæum*, is one so large as to bury a Frog. And *Boetius* (a) affirms that Pieces are found sometimes as big as a mans Head.

(b) Tavar.
Ind. Voyage.

Found in great quantity in *Pomerania*, and upon the Coast of *Prussia* in the *Baltick-Sea*. The *Electör* of *Branden-burge*, Sovereign of that Coast, farms it out (b) for twenty Thousand Crowns yearly. Also plentiful on the Coasts of *Soffala*, *Mosambique* and *Melinde*.

(c) De Dem.
lib. 2. c. 160.

Boetius describes a Powder, (c) in which Amber is the chief Ingredient, and which he highly commends for the *Epilepsie* both in Children and grown persons. The two Salts of Amber united, saith *Terzagi*, (d) make an admirable Specifick for that Disease.

(d) Mus.
Septal.

Take *Yelks* of Eggs sixteen, *Gum Arabick* ʒij, *Gum* of *Cherry-Tree* ʒj. Dissolve them, and set them in the Sun for an Artificial Amber. Amongst the many Opinions of the Original of Amber, I put this question, Whether it is not a kind of harden'd *Petroleum*?

FLAKED STONE-COAL. *Lithanthrax scissilis*. By some called *Black Amber*; not properly. For, when fir'd, it hath scarce any tast or smell. Neither doth it yield any Oil, or melt, as Amber. Only makes a very weak and thin Flame, which presently vanishes; and little smoak. Yet keeps fire for a considerable time. 'Tis black, glossy, and pretty hard. Yet being struck, easily breaketh into Flakes of a square Figure. Found in *Misnia*, *Bohemia*, &c. In some Pits two Hundred paces deep. (d)

(d) Boet. de
Gem. & L.

A STONE taken out of the *Dead-Sea*. Blackish and somewhat flaky. Dissoluble with *Spirit of Nitre*. When fir'd, it yields a sulphurous scent. Yet the barbarous *Arabi-ans* use it for fuel.

A Piece of Jet. *Gagates*, from *Gaza* a River of *Lycia*, where

where first found. Given by Sir *Rob. Moray*. Of a shining colour, and in some places, flaky. It cracks when held to the fire; and in it, burns with a thick flame and smoak, and very stinking. If rub'd till its warm, it takes up pieces of Feathers, and such light Bodies. 'Tis found in *France, Sicily*. And in this *Island*, in *Cleaveland*, on the top of *Huntley* and *Whitby Clifts*, where the Sea-water never comes.

Pit EBONY. *Ebenum fossile*. Very brittle, and when held in a flame, breaks into Flakes; it burns, with a footy smoak, into ashes; but with scarce any flame.

A parcel of ORPIMENT. *Auripigmentum* s. *Arsenicum croceum*.

Native SULPHUR or BRIMSTONE, crystalliz'd, of a pale Golden colour, and semiperspicuous. Sent from *Peru*. The like is described in *Calceolarius's Musæum*, and by *Wormius*.

ANOTHER Piece, of such a like colour. Found in the *Pike of Tenariff*, and given by *Dr. George Trumbal*.

A Lump of Native SULPHUR of the colour of some *Olibanum* Drops, or opacous yellow *Amber*. From the same Hand, and Place. As also,

Two Pieces of SULPHUR ORE. One, *Earth*, of a brown colour; the other, *Stone*, of a Sand-colour and gritty.

Native SULPHUR of *Island*. Of the colour of the common factitious *Brimstone*; and immersed in a stony Bed.

SULPHUR, of a curious Orange-colour, extracted out of *Gold-Ore*. Given by *Henry Oldenburge Esq;*.

SULPHUR ORE of *Freyberg*. Here are three Pieces. One, almost of the colour of *Cinabar*. Put into the fire, it smells like *Brimstone*, but flames not. The other two, consist of blackish and ash-colour parts mixed with the red; together with some grains of *Mundick*. If fired, they smell like the first, but not so strongly; nor make any flame.

GREEN SULPHUR-ORE. Like that in the *Copper-Mines* of *Suecia*, mention'd by *Wormius*.

SULPHUR-ORE of *Island*. Opacous, and immersed in a blewish *Glebe*. If burnt, it hath the scent of *Brimstone*; but yet weak, and flames not.

(a) Num.
104.

Of the nature of *Sulphur*, *Copperas*, and *Alum*, see a very good Discourse in the *Phil. Transactions*. (a) Of the Uses, see *Agricola*, *Libavius*, *Grollius*, &c. I have seen a *Tincture* of *Sulphur* of Mr. *Boyls*, brought over the *Helm*, which will fume all away. I remember not where he describes it, but as I take it, 'tis made with *Sal Ammoniac*.

CHAP. III.

Of EARTHS.

TWO Parcels of EARTH RAINED on the *Archipelago*, upon the Eruption of *M. Vesuvius*, Dec. 6th 1631. Given by *J. Evelyn* Esq;. One, is gritty, and of the colour of *Amber*. The other a soft *Bole*, and looks like powder'd *Jalap*. I dropped some *Oil of Vitriol* on them, but they stir not. This *Earth* began to rain about Ten of the Clock at Night, and continu'd till two next Morning: So that it lay two inches thick on the Deck of Captain *W. Badily's* Ship, who sent this Relation. While it rain'd, no Wind stirring. It fell in several parts a hundred Leagues distant. (b)

(b) See *Phil. Trans.* N. 21.

A parcel of EARTH, RAINED lately upon *Tenariff*. Given by Mr. *Joseph Bowles*, a Merchant in this City. Of a pale Clay-colour, and insipid. Yet upon the affusion of *Oil of Vitriol*, makes a suddain *Effervescence*; herein different from the former.

FINE SAND, from a Sand-Pit near *Bruley* in *Kent*. Given also by Mr. *Evelyn*. Of this is made the clearest and best *English* Glas. It consisteth of some Grains, as clear as *Crystal*: with which others obscure, being mixed, give a whitish ash-colour to the whole Mass.

A Sandy substance of a Gold-colour, found in a Vein of Stone in *Hartford* in *New-England*.

Black SAND of *Virginia*.

Black SAND found on the shore near *New-Haven* in *New-England*; with some Grains of red and white.

The like out of *St. Christophers* Island.

Fine white SAND of *Saco* in *New-England*.

Of

OF BOLES and other EARTHS, here are examples of all colours, as White, Ash-colour'd, Yellow, Red, Green, Blew, Brown, Black. Of which in their Order.

A parcel of MELITA EARTH. Given by Sir *Phil. Skippon*. By some called *St. Pauls Earth*. 'Tis of a white colour, but inclining to that of *Mortar*. Not gritty, yet less soft than many other *Earths*. Makes a strong *Effervescence* with any *Acid*. *Cerutus* (a) extols the use of it in *Pestilential Feavers*, and against Worms in Children, and not unjustly. Not only the *Earth* it self, but the Images, Vessels, and the like, made hereof, are fabled to derive these and other Virtues, as against the bitings of *Serpents*, &c. from *St. Paul*, who liv'd sometime there, and miraculously preserv'd himself from the Venome of the *Viper*. And *Wormius* (b) hath given himself the trouble to transcribe a printed Paper hereof.

(a) Mus.
Calceol.
Sect. 2. p. 130

(b) Mus.
l. 1. c. 4.

SAMOS EARTH. 'Tis white, and softer than the former. Maketh an ebullition with any *Acid*; but very weak and slow. It hath somewhat of an aromattick Taste, like that of calcin'd *Harts Horn*. Of this also Vessels were antiently made of great esteem.

STONE MARROW. *Stenomarga Agricolaë*, i. e. *Saxi Medulla*: because found between the Commissures of great Stones. *Agaricus Mineralis, Imperato*; from its likeness to *Agarick* in colour; but no further. For between the Teeth it feels somewhat like fine sand or grit; and hath no Taste. Nor is it sensible of *Acids*. 'Tis sometimes used by *Chirurgions* for the drying of *Ulcers*.

A BOLE like that of WHITE (c) *Terra Lemnia*. Very close and heavy, and when scraped, of a pale white, smooth, and glossy; almost like to white Wax. 'Tis but slowly dissolved in the mouth.

(c) Mus.
Worm. l. 1.
c. 4. p. 9.

This and other like smooth *Earths* are commonly called *Pingues*, or *Fat*: absurdly, for *Læves* or *Subtiles*. Their seeming *Pinguitude* proceeding only from the exquisite fineness of the Particles of which they consist.

A smooth BOLE, almost of the colour of *Castile Soap*. More easily dissolved than the former, so as it seems to melt in the mouth like Butter.

A parcel of very white, light, and soft EARTH. Taken out of the Cave opened at the *Royal Fort* at *Plymouth*;

where it lies in little Veins containing much water. Supposed to be the *materia prima* of white Marble.

A White EARTH lying in a Load degenerated from *Tin*. very gritty, and insensible of *Acids*.

A White EARTH, with a Ray of Red; very soft, without any grit, and unaffected with *Acids*. Nor hath it the common Taste of *Boles*, but is altogether insipid. Found in the same place, as the former; but in different Veins. Supposed to be the *Embrio* of white and red Marble.

A BOLE of a yellowish sandy colour; somewhat gritty and friable.

SILESIAN BOLE. Of a redish yellow, exactly like the paler *Emplastrum de Minio*. As dense as any other, crackling a little betwixt the Teeth. Yet without the least Particle of Grit; feels as smooth as *Castile-Soap*; scrapes with a gloss; and breaks like *Bees-Wax*, or the Salve above-said. Tasteth like other *Boles*.

The BOHEMICK sealed BOLE. It agrees in all properties with the former; saving that it hath somewhat more of red.

The HEPATICK BOLE of LEMNOS. Of kin to the red *Lemnian*. And answers to that which *Wormius* describes by the Name of *Terra sigillata hepatica*. It stirreth not with *Acids*.

ANOTHER of the same more PALE. Somewhat harder than the *Armenian Bole*. It makes a small ebullition with *Oil of Vitriol*, and with *Spirit of Nitre* a very strong one.

I take the principal Difference between *Earths*, as applied to Medical Use, to be this, That some are not affected with *Acids*; others are: Those, *Pauperes* or *Fatuae*; coming nearer to simple or meer *Earths*; These *Saline*, or impregnated with a Mineral *Alkali*, and therefore of greater energy.

A smooth and pale redish CLAY, lying in a little vein, running *East* and *West*, through a great Pillar of Sand, in a firme Marble-Rock. Supposed to be the *Embrio* of the red Marble.

Red LEMNOS EARTH. As red as *Radle*; but much more close and coherent, and so colours not the Fingers. *Theophrastus* (a) reckons up three sorts of *Terra Lemnia*; sc. the Deep Red, the Pale Red, and the Whitish.

(a) Lib. de
Lapid.

Celebrated

Celebrated by some of the Antients against Poyson, which, if right, it expels by Vomit. Yet *Theophrastus* saith, That in his time, it was used only for *Painting*.

ARMENIAN BOLE. From that part of *Armenia* next to *Cappadocia*. Both of a deep and a pale Red. Very soft, and easily rub'd to powder. Never makes any ebullition with *Acids*. First brought to *Rome* in *Galen's* time, when the *Plague* was there. In which, and other *Malignant Diseases*, it hath generally been esteemed of good use. *Joubertus* relates, as a Testimony of its Virtue, That four men preparing some *Cathartick* of *Antimony*, were all well nigh suffocated. And that upon his giving them each ʒij of this *Bole*, they became very well. But the question is, Whether so soon as they were got out of the reach of the *Antimonial Fumes*, (from which we may be sure he took them) they would not have been well without it?

An *English* BOLE, like the *Armenian*. From Sir *J. Hoskins*.

A Red MINERAL EARTH, with some little glossiness in some places. Of the colour of the deepest *Armenian Bole*.

Red *Cornish* MARLE, used in *Agriculture*. It hath some grains of fine Sand, which, through a Glasse, looks like Metal. A piece also of common *Radle*.

A BOLE consisting of Red and White Plates, thin and parallel; so as to look like striped Work.

BERG-GRUN; a Green *Earth*, the sediment of a green Water in the *Copper-Mine* at *Herngrundt*. Given by Dr. *Ed. Brown*. 'Tis used by *Painters*.

A VERDAZURINE BOLE. So I call it, for that it is on the out-side of a blewish green, like *Verdegriese*. Within, of the colour of a *Leek*. It sticks to the Tongue, as the *Armenian*, or *Lemnian*, and hath the like Taste. Stirs not with *Acids*. Not unlike to that, which is described by *Wormius* with the Name of *Creta Viridis*. Yet cannot be the same, unless that Name be ill given: for *Chalk* properly so call'd, maketh a strong *Effervescence* with any *Acid*.

A GREEN EARTH like that which *Kentman* (a) calls *Saponariam* s. *Fulloniam*. (a) Fossil.
Nomencl.

A BLEWISH Grey MARLE mixed with Red. Used in *Agriculture*.

A BLEWISH EARTH, with the signature of an *Escallop* upon it. It gently dissolves with *Acids*.

Earthen

Earthen BALLS, about as big as mounting Stones, of a Blewish colour, or that of *Tobacco-Pipe-Clay*. With other irregular Lumps of the same nature: found among the *Earth* of a Hill overturn'd at *Kenebank* in *New-England*.

A Piece of *IRISH-SLATE*, so called. Given by Mr. *Rob. Hook*. Of the same colour as the *Cornish*, only somewhat paler. But as soft as the *Terra Lemnia*, and several other *Boles*. And is therefore to be reckon'd amongst them. Besides the common Taste of *Boles*, it hath a little Astringency: Yet not alike perceived in all, for there is better and worse: which *Apothecaries* will do well to observe.

(a) Ibid.

Kentman (a) mentions a sort of very white *Earth* near *Padoa*, which in a short time would turn Blew, only by being exposed to the *Aer*.

A sort of *BROWN EARTH*, very light; lying in Veins, incompassed with a Body of greenish Sand. From *Cornwall*.

A *BLACK EARTH*, taken out of a spot enclosed in the same Sand, without any Vein issuing from it.

PART IV. Of Artificial Matters.

SECT. I.

*Of Things relating to CHYMISTRY, and to other
Parts of NATURAL PHILOSOPHY.*

ALL Arts are referred either barely to the Observation, Or also to the Command and Management of their Object, for the Use of Man. But I must speak of those Particulars here preserv'd, in that Order, as they will bear: and so shall reduce them to four General Heads, *sc.* such as relate to *Chymistry* and other parts of *Natural Philosophy*; To the *Mathematicks*, *Mechanicks*, and *Antiquity*.

The *Phlegme*, *Oil*, *Spirit*, *Volatile*, and fixed *Salts*, both of the Serous, and Grumous Parts of HUMANE BLOOD. Together with the *Oil*, *Volatile*, and fixed *Salts*, of that of an OX. Prepared, and given by Dr. *Walter Needham*. By whom also was read a Discourse before the *Royal Society*, in which, as I take it, the proportions between the said parts, with divers other Remarques were deliver'd. But I meet with no *Register* hereof. The different Proportions of the said parts, as they are observable in the several *Viscera*, I may have occasion else where to represent. I shall now only note, That the fixed *Salts* of *Blood* above mention'd, are three of them Grey, and all but weak. The fourth, *viz.* that of the serous part of an *Oxes*, although calcined to whiteness; yet is not so strong, as That of most *Vegetables*.

The OIL of TOBACCO, distilled *per descensum*. The notable effect hereof upon a *Cat*, was try'd some years since before the *Royal Society*. One or two Drops of it being

ing put upon her Tongue, she fell immediately into horrid *Convulsions*, and dy'd within the space of one minute of an hour. This very *Oil* I have several times prescribed to my own Father (who takes *Tobacco*) in *Lint* to be held betwixt his Teeth, against the *Toothach*, with a good effect; and no ill one. But I, who take none, having once us'd it, my self in the same manner, although I swallow'd not so much as any of my spittle, yet it made me extremely sick, and vomit once or twice.

The Stillatitious OIL of LAWANG BARQUE. Sent from *Java major* by Sir *Phil. Vernatti*. It partaketh much of the colour, smell, and tast of That of *Sassafras*; but is much more fragrant. The *Oil* of *Sassafras* is distill'd only from the Wood. But if one were distill'd from the Barque, it might equal This.

(a) Lib. 1.
c. 63. An *Oil* distill'd per *Alembicum*, from the ROOTS of the CINAMON-TREE resembling *Camphire*. From the same Hand and Place. The Roots being only bruised, and steeped in Water, are then distill'd. The Tree is about the bigness of the *Olive*. Described by *Linschot*. (a) Grows in *Cavit* and *Subanin*, but the best and most in the Island *Seylon*; there in whole Woods.

The LIQUID OIL of MACE, by expression. 'Tis made of fresh *Mace*. Hath some few curdled parts, as sometimes in that of *Olives*: but the most part of it is liquid without heat, which the best expressed *Oil* of *Mace* in the Shops, is not. Almost of the colour of a Tincture of *Saffron*, and very fragrant. Confirming what *Linschot* saith, sc. That the original colour of *Mace*, is Scarlet.

The FIXED SALTS of *Carduus bened.* *Garden* and *Sea Scurvy-Grass*, *Ash* and *Oak Barques*, *Rosemary*, *Mint*, *Mugwort*, *Agrimony*, *Wormwood*, *Sorrel*, *Mallows*, *Liquorish*, *Anise-Seeds*, *Sena*, *Jalap*. By Me prepared and given. Together with a Discourse read before the *Royal Society* concerning the same, which I purpose to publish ere long. I shall here only Note, that although Many think and affirm, That all the Fixed Salts of Vegetables are alike: yet by These, duly managed, it doth appear, That there is a great difference, both as to strength, and otherwise, between divers of them, even when they have been equally calcin'd. So far, that the promiscuous use of some of them, in Physick, is unsafe:

unsafe: as, for instance, of *Tartar* and *Wormwood*; half a Scruple of the former, being as strong as one whole Scruple of the latter. Of the Fixed Salt of Vegetables, see a Discourse in the *Phil. Transact.* N. 107, & 108. Of the Volatile Salt, N. 101. (a)

An *East-Indian* Composition (as it seems of Vegetables) called *CATO*. Very astringent, and infus'd in water makes it yellow. Us'd by the *Indians* against the Inflammations of the Mouth or Throat.

(a) Both
communicated
by Dr.
Daniel Cox.

SAL AMMONIAC sublim'd in a Sugar-Mould from Beds of the same taken from a *Coal-Mine* near *New-Castle* upon *Tyne*; of which, see the foregoing part of this Catalogue. Prepar'd and given by Dr. *Luke Hodgson*.

SPIRIT of *Sal Ammoniac* distill'd from the said Salt mixed with *Quick-Lime*. By the same Hand.

The Parts of the Medical *WATERS* of *SCARBROUGH*. Prepared and given by Dr. *Witty*: together with an account of them. But this I find not. The Preparations are these, The *Phlegm*, and *Acid Spirit*, not strong. The Sedement upon evaporation, of an ash-colour, a bitterish and nitrous Taste. The *Precipitate*, upon the mixture of *Gall-powder*; black, and of little Taste. One or two Grains will precipitate 3j out of a Gallon of the Water. The Nitrous or Essential Salt, as I take it, before the Precipitation be made. The like Salt, after the Precipitation is made. These Salts have also somewhat of a Nitrous Taste, but mixed with a smatch of a Vitriolick: And the latter, I take notice, is figur'd into long square Crystals, or little square Bars. The Black Precipitate calcin'd. The Lixivial Salts, made, as I take them, from the Precipitate, and from the simple Sediment or Extract both before and after Precipitation made: somewhat like to that of *Vitriol*.

What ever Ingredients, as *Niter*, *Vitriol*, or other known Salts, may go to constitute these abovesaid; I am of Opinion, That the predominant is some Metallick Principle different from them all.

A Solid *HERMETICK PHOSPHORUS*; a mixed Matter, which being expos'd for about half a minute of an hour to the Sun, or only to Day-light, or to a bright Fire or Candle; will shine in the dark for some minutes. Made by Dr. *Fr. Slare*, and by him given to the *Royal Society*;

Apr. 3. 1679. The first of this kind was made by Monsieur *Baldwin*, a German Lawyer who gave it the Name above, but with no direction for the making of it. Nor doth he so much as mention the Materials.

I call it *Solid*, to distinguish it from two Liquid kinds. The Author of one, supposed to be Mr. *Dan. Krafft*. The other invented by the Honourable Mr. *Boyle*; which He calls the *Aerial Noctiluca*; and whereof He hath lately published an excellent *Discourse*. In whose *Laboratory*, the solid kind was also made by his direction, several ways.

Of the Process for This here, Dr. *Slare* some years since received a hint from Dr. *Christian Connerding*, *Archiater* to the Duke of *Zell*. And not hearing of any one, amongst many that have try'd, besides these Three, to have succeeded in the making of it, he hath imparted the following Account.

Take good firm *Chalk*, ignite it in a *Crucible*, and then powder it. Put into a pint or half a pint of strong *Spirit of Nitre*, *Cochleatim*, as much hereof, as will serve well to satiate it, *i. e.* till it becomes sweetish, and makes no *Effervescence* upon the injection of the *Chalk*. Then dilute this Liquor with fair Water, filtre it through a Paper, and so evaporate it in a large Glass, or glazed Vessel, or good *Hessian Crucible* to a dry *Salt*. The preparation whereof may be perform'd in four hours: whereas I have seen a Process, that would take as many Weeks to follow it.

The main business lies in the good *Enchiresis*; about which these several Directions must be carefully observ'd.

First you must prepare a Vessel of Clay, somewhat like a shallow *Coffee-Dish*, of three, four, or five inches in Diameter, and an inch in depth, very well baked and Neal'd. Then place it under a Muffle, after the manner of a Refining Furnace, in the place where the Cuppels usually stand: and so make it red hot. Then put the prepared *Salt* into it, by little and little, not above 3j. or 3ij at a time. Keep the fire to that degree, which will suffice to make the *Salt* boil in the Dish, so as to spread it self every way, and creep up the sides of it. Before the *Salt*, last put in, be consumed, be sure always to be ready, to make a new addition, otherwise your labour so far is lost, and you must begin again.

When

When five or six Drachms are fum'd away, take the Dish nimbly out of the fire, so soon as the *Salt* last put in is dry. If you have wrought well, what remains in the Dish will be yellowish in some parts, and every yellow part will shine. Secure this Matter from the Air by fitting and cementing a Glass to it: otherwise it will loose its property in one Week.

As to the Cause of this strange *Phænomenon*, Dr. *Slare* continues to this effect. I shall in short offer my Thoughts, and refer them to your Judgment. Two Questions may arise: What it is in this Mixture that yields the light? and, How it doth it? As to the first, I take it to be the pure fiery part of the *Spirit of Nitre* embraced by the *Chalk*. For that the rest is weak and phlegmatick; as appears, if it be distill'd. Also, that about the end of the Operation, a black Fume begins to rise and fly away. That if by continuing the Dish too long in the fire, you drive all the Nitrous parts away, the *Chalk* which stays behind will not be luminous. Or if the Matter duly prepar'd, be expos'd to the Air, and thereby prey'd upon, the same effect will follow.

As to the Second, I suppose, That it shines not by Imbibition of Light, but by Impression from it, from whence proceeds a motion therein productive of Light. Which we may the rather be induced to believe, In that if it be put into an Iron Cover, and then an Iron Box, and a good heat given to it, it will shine so vigorously as to seem to kindle the Air about it. That two Men by following their blow close, will make a Bar of Iron glow, or shine in the dark. And although the Impulse of Light may seem small; yet upon Bodies nearly related to it, as This seems to be, it appears to be great. As in those odd effects it sometimes hath upon Infants unus'd to it; and People that have sore Eyes; or have been newly Couch'd; as it happen'd to Dr. *Castle* sometime since, who by making bold with his Eyes too early, (*i. e.* by a too frequent admission of light to them,) after that Operation, did thereupon suffer such extreme pains, and mischief in his Eyes, that he now dispairs of ever seeing more.

Mr. *Haac* (a) saith he, hath frequently repeated the following Experiment upon this *Phosphorus*. If it be expos'd to the Morning Light a little before Sun rising, it presents

(a) Author of the Experiment upon the Load-stone, Part 3.

presents a bright Rosy hugh. As the Sun approaches the *Meridian*, it advances to a higher and more firey Complexion, like that of a red hot Iron. A little after Sun-set, declines to a pale wan colour, like *Chalk*, or rather *Mother of Pearl*.

Expos'd, saith he, to the light of a Candle, or flaming Fagot, it receives a pale Luminous colour, as from the Sun towards setting. But being expos'd for a considerable time to the most clear Moonshine that I have seen in *London*, I could not perceive it to become Luminous in the least.

It hath been kept, saith he, in the *Vacuum* of my Great and Noble Patron, the Honourable Mr. Boyle called *Vacuum Boyleanum*, and by his Highness Prince Rupert and Himself observ'd, for above four or five months, without any diminution of its shining property.

He adds, That he hath lately found a way to affix this Shining Matter to Glass, whereby some not unpleasing Experiments may be made. Thus far Dr. Slare.

As to his Ingenious Conjectures of the Subject and Cause of Light in this *Phosphorus*: because he hath desired my Opinion, I shall therefore subjoyn it in a few lines.

As to the first, What it is which gives the Light: It seems hard to say, Whether it be the *Cretaceous Salt*, the *Nitrous Salt*, or some *Igneous Particles* incorporated with them in the Operation? It is plain, That one way or other, they do all concur to produce it.

As to the Question, How these *Particles* give light? It should first be stated, What Light is; Whether it be a Body? Which, though much disputed, yet in strict speaking, is an absurd Question; all one, as to ask, Whether a Quality, be a Body? But the meaning of the Question is, or ought to be, Whether there be any Body in Nature, which is the peculiar subject of Light, or metonymically may be called Light? Or whether more Bodies than one, may successively be the immediate subject thereof? If so, Whether it be any other Adjunct besides Motion? If only Motion, Whether as there is one peculiar Motion, at least for a Musical sound, so another for Light? And in regard there are some Experiments which seem to favour each of these Questions: such an Answer should be given as will

cor-

correspond with all those experiments ; and will be too long to suit with this Catalogue.

I shall here only say, I am inclined to believe, That, in this Case, all the three Bodies above mention'd serve together to compose an Apt Recipient of that which is the true Luminous Body. That, as in the mixture of *Sulphur* and *Water*, sulphurious *Salts*, of affinity with both, are used as a medium: so here, the Cretaceous Parts serve to fix the Nitrous ; and the Nitrous, to fix the Igneous ; being of a middle nature and readily incorporated with them both. And being in this union exposed to the Sun Beams, or other Light, the Igneous parts serve, for some time, to retain a certain portion of such as are Luminous, or to give, as I may say, a degree of Fixation to These also : and that therefore this Mixture is kindled or made to shine, by putting it into the Light, as a stick is made to burn, by putting it into the fire.

Of shining Flesh, see a Relation of some Remarkable Circumstances, made by Dr. *J. Beal*, and published in the *Phil. Trans.* (a)

(a) N. 125.

Of Instruments relating to Natural Philosophy.

AN AIRE-PUMP ; or an Engine to exhaust the Air out of any Vessel fitly applied. Contrived and described (b) by the Honourable *Rob. Boyle* Esq;. Who hath also made therewith, and published in several Tracts, a great variety of accurate and instructive Experiments.

(b) Experiments *Physico-Mechanick* of the Spring of the Air.

A Great CONDENSING ENGINE of Brass ; contrived to ram and crowd a great quantity of Air into a little room. Whereto is also fitted an Iron Gun or Barrel.

A Little CONDENSING ENGINE of Glass, with a Brass-Neck, Rammer and Valve fitted to it.

A WEATHER CLOCK. Begun by Sir *Chr. Wren*, (c) now President of the *Royal Society*. To which other Motions have since been added, by Mr. *Robert Hook* Professor of *Geometry* in *Gresham-Colledge*. Who purposes to publish a Description hereof. I shall therefore only take notice,

(c) See Hist. of the *Royal Society*, p. 312.

notice; That it hath fix or seven Motions; which he supposeth to be here advantagiously made altogether. First a *Pendulum* Clock, which goes with $\frac{1}{2}$ of a 100 *lib.* weight, and moves the greatest part of the work. With this, a *Barometre*, a *Thermometre*; a *Rain-Measure*, such an one as is next describ'd; a *Weather-Cock*, to which subserves a piece of Wheel-Work analogous to a way *Wiser*; and a *Hygroscope*. Each of which have their *Regester*, and the *Weather-Cock* hath *Two*; one for the *Points*, the other for the *Strength* of the Wind. All working upon a Paper falling off of a *Rowler* which the *Clock* also turns.

An Instrument for MEASURING the quantity of RAINS that fall in any space of time, on any piece of Ground, as suppose upon one Acre in one year. Contrived by Sir *Christopher Wren*. In order to the *Theory* of Vapours, Rivers, Seas, &c. A triangular Tin-Vessel hanging in a Frame, as a Bell, with one Angle lowermost. From whence one side rises up perpendicular, the other sloped; whereby the water, as it fills, spreads only on one side from the centre, till at length it fills and empties itself. Which being done, a leaden poise, on the other side, immediately pulls it back to fill again.

The Model of an Iron Instrument to fetch Earth, or other Bodies; from the bottom of the Sea; made with several *Valves* and *Springs* to open and shut it for that purpose. Contriv'd by Mr. *Hook*.

A LAMP-FURNACE. By the same Person. Towards the bottom is a partition with a hole in the middle; below which, stands a Vessel of Oil with a Wick, and a Cork to float it, so as to stand within the said hole. Over this is placed a *Pan*, viz. with the bottom about two inches distant from the partition. Within which, is fine Sand. Design'd for the hatching of Eggs, in order to observe the Process of Generation. As also for digesting of Liquors.

A pair of Semicylindrick LAMPS. Contrived, describ'd, (a) and delineated (b) by the same Person. Design'd, for the poyfing the Liquor which is to feed the Flame, so as to keep the surface thereof always at the same height, till it be all consum'd. And thereby not only to secure, that it never desert the Flame, and so to save Attendance: but

(a) See his
Lampus,

p. 14.

(b) Ibid.

Tab. 3. Fig. 4.

but also to keep the Flame of equal strength, for all such purposes as require it.

The MODEL of an EYE. In which the Humours are represented by Glasses of an answerable Figure.

A BURNING-GLASS, about half a foot in Diametre.

A HOLLOW BURNING-GLASS. That is to say, two thin concave Glasses set together, and so to be fill'd up with water when it is us'd. About the same bigness as the former: but burneth not altogether so strongly. Contrived and given by Dr. *John Wilkins* late Bishop of *Chester*.

A Large MICROSCOPE, with three Glasses, and several Screws to fit it for all manner of positions. It magnifies the *Area* of the Object to above a hundred times the extent thereof to the bare Eye.

A Lesser MICROSCOPE, somewhat more managable than the former.

The advantage of one with more Glasses, is that it takes in a bigger Object, or a greater part of it. Of one with a single Glas, that it shews the Object clearer. So that to have a distinct representation of it, 'tis convenient to make use of both. Of the latter kind, I have seen several made by Mr. *John Mallin* in this City, not only with melted, but with Ground-Glasses so very small, that one of these Ground-Glasses being weighed in the *Affay-Scales* in the *Tower*, was found not above the fourscorth part of a Grain. The Diametre or Chord $\frac{1}{37}$ th part of an inch. Another, so small, that those Scales were not nice enough to weigh it. The Chord hereof to that of the former, is as two to three. These are the clearest and best that ever I saw.

An OTOCOUSTICK, or Instrument to help the hearing, made of *Ivory*. In shape like a *Funnel*, saving that the *Nose* is bended for the more convenient application to the *Ear*, and reception of the sound. Given likewise by Bishop *Wilkins*.

Another of *Copper*, funnel'd at one end, as the former, and also belly'd in the middle.

A Third of *Tin*, of a *Conick* Figure, and with a *Cochlea* within it. The best of all the three, is the first.

A Pair of HYDROSTATICK Scales. Used, amongst other purposes, to examine the specifick Gravity of Bodies.

A

A Box of ANATOMICK Instruments; *sc.* Saws, Steel and Ivory Knives, Chizels, a Forceps, a Leaver, a Tenter, a Sirynge, Pipes, Probes, and Needles.

SECT. II.

*Of Things relating to the MATHEMATICKS;
and some MECHANICKS.*

TO *Astronomy.* A REFLECTING TELESCOPE. Contrived by Mr. Isaac Newton, Professor of the *Mathematicks* at Cambridge. Whereby not only the cumber and charge of other *Telescopes* is avoided; one of these less than a foot long, magnifying as much as another of six feet; but the Object likewise, both by a more regular Refraction, and a less expence of Rays, is much more clearly represented.

It consists of a *Tube* open towards the Object, and close at the other end. Where is placed a *Metalline Concave*, instead of an *Object-Glass*. Near the other end, a flat *Speculum*, also of *Metal*; placed obliquely towards a small *Eye-Glass*; *sc.* upon that point of the *Tubes Axis*, on which the perpendicular falls from the said *Eye-Glass*. So that the Rays coming from the Object, first fall upon the *Concave*; are thence reflected to the flat *Speculum*, thence to the *Eye-Glass*, and through that deliver'd to the Observers Eye. The Authors Description hereof at large; together with a Discourse of the Materials which are or may be thought fittest for the *Speculumis*; a *Table* of Apertures and Charges for several lengths; As also Mr. *Hugen's de Zulichem's* Remarques on the same; see in the *Phil. Transactions.* (a)

(a) Num.
81, 82.

Arithmetick. An Instrument for working Questions by Multiplying and Dividing. Contriv'd by Mr. *Hook*. Who purposes to give the Description hereof himself.

Geography. A WAY-WISER. Given by Bishop *Wilkins*. 'Tis very manageable. It hath five *Indexes* pointing to so many different Measures, *sc.* Perches, Furlongs, Miles, Tens of Miles, and Hundreds of Miles; and turn'd about with as many Wheels. Made to Work in a *Coach*, thus; In the

the middle of the *Axletree* is cut a little Box to receive the *Wiser*: from whence the *Axeltree* is made hollow to the end. In this hollow lies a *Rod*, loose from the *Axletree*, and fasten'd at one end to the *Nave* of the *Wheel*, and so turns round with it. And with a *Worm* it hath at the other end, at the same time, it turns the *Perch-Wheel* of the *Wiser*, and that all the rest. Yet by this measure, 1 yard will sometimes be lost in a 100 yards.

Architecture. A Model of a Geometrick FLAT FLOOR. Given by the forementioned Person. Contrived and delineated (a) by Dr. J. Wallis Professor of Geometry at Oxford. Who was pleas'd to give me the following Account, as an Abstract of that he hath formerly published hereof. (a)

I did first, saith the Doctor, Contrive and Delineate It in the Year, 1644. at *Queens-Colledge* in *Cambridge*. When afterwards I was made Professor of Geometry at *Oxford*, about the Year, 1650. I caused it to be framed of small pieces of *Wood*, representing so many pieces of *Timber*; prepar'd by Mr. *Rainsford* a *Joyner* in *Oxford*, and put together by my self.

(a) See his
Book De Mo-
tu, Cap. 6.
Prop. 10.
Fig. 243.

This I shewed soon after to divers in *Oxford*, and particularly to Dr. *Wilkins*, then *Warden* of *Wadham-Colledge* in *Oxford*. Who was so well pleased with it, that he caused another to be made for himself, according to that Pattern. Which he kept by him for many years, and afterwards presented to the *Royal Society*.

After the King's *Restauration*, I caus'd another to be made; and, in the Year, 1660. presented it to his Majesty; who was well pleas'd with it, and caused it to be repositied in his *Closet*.

On the Model first mention'd, I Read two *Publique Lectures* at *Oxford*, on the *Vespers* of the *Publique Act*: the one, in the Year, 1652. as to the *Construction* of it; the other, in the Year, 1653. as to the *computation* of what weight every *Joynt* of it sustains; whereby it might be the better judg'd how far it may be safely practis'd. The greatest weight charged on any one *Joynt*, doth not amount to Ten-times the weight of one *Beam*: And the greatest weight bor'n by any one *Beam*; not to seventeen times its own weight: and even this, not laid all on the same part, but distributed to several parts of it. The sum of these two *Lectures*, is to be seen in the Sixth Chapter of my Book *de Motu*.

A a a

A

A Third *Lecture*, much to the same purpose, I read, May, 1699. in the same place, before the present Grand Duke of *Tuscany*, who honoured the University with a Visit, and me with his Presence at that *Lecture*. After which, he was pleased very particularly to consider both the Delineation and Model, and declared himself very well pleased with it,

The contrivance is obvious to the Eye. The outsides represent the Walls of the Building on which this Flat Floor or Roof is to be laid. The Beams next adjoining to the sides, have one end lodged on those Walls; the other end sustained by another Beam, lying cross; both ends of which, are in like manner sustained by other cross Beams; and those again by others; till they reach the other Walls. So that no one of them can fall, unless the Walls fail, or the Beams break: all mutually sustaining each other without any Pillar or Prop to support them, besides the outer Walls.

The Models I caused to be made, and that of the *Royal Society* in imitation thereof, are in Breadth, about four times as much as the Length of the longest Beam. But may be continu'd, at pleasure, to farther breadth, as shall be thought fit. With this Caution: That the farther the Work is continu'd, the greater Weight will be charged on every Joynt; especially near the middle. And though in this Model, no one Beam is charged with so much as seventeen times its own weight: yet if the Work be continu'd to a greater breadth, the proportional Weight will be thereby increased. And therefore must be limited, according to the strength of Timber, able to bear more or fewer times its own weight.

I do not know, that yet it hath been reduced to practise, in more than four Pieces, in this Form. Such is one of the Floors in the *Tower* of the Publique Schools at *Oxford*: the Breadth whereof, to the Length of the Beams, is as three to two. But may doubtless be continu'd much further: especially in such a Roof or Floor, as is not to bear much more than its own weight.



Thus, for instance, a *Bowling-Green* of near an Acre of Ground, may be cover'd with a Frame of long slender pieces,

pieces, without any other Prop than on the sides, for *Vines*, or other like *Plants* to run upon, so as to shade the whole.

Note here, That whereas the ends of the several pieces are to lie upon those that cross them, about the middle thereof; it will be necessary at every Joynt to abate both pieces half way, or near it; that one may be thus let into the other, and the whole reduced to a Flat. But whether such piece, so abated doth end even with that on which it lies, or doth lie over somewhat beyond it; is indifferent. And though That may seem more elegant; This, perhaps, may be fitter for use.

Each piece, I say, must be so abated half way, or near it. For, whereas those Beams, especially if of a considerable length, will, with the weight, bow a little; if this abatement be somewhat less than half way, (whereby without such bowing, the whole would somewhat rise in the middle) it will by such bowing be reduced to a Flat.

Note also, That a Frame thus contriv'd, needs neither *Nail* nor *Pin*; the several pieces fastening, as well as supporting one another. Yet, if it be to bear a great weight more than its own; it will be convenient to fasten each Joynt with *Pins*; and, if need be, to strengthen it with *Iron-Plates*, or line it with other pieces of *Timber*, to be fasten'd with *Iron-Bolts*; to make amends for what is weaken'd by the abatements at the *Joynts*: which will make the whole Frame exceeding strong.

A Model of a Double Winding STAIR-CASE. The Foot of one is opposite to that of the other; whereby both make a parallel ascent, and within the same *Cylinder*. The *Newel* or *Column* in the *Centre*, is hollow, and built with long *Apertures*, to convey Light, from *Candles* placed at the bottom, and on the sides of the *Newel*, into both the *Cases*.

Another, of a single one, with a solid *Column* or *Newel*.

Navigation. A Model of the *Hull* of a DOUBLE-BOTTOM'D SHIP. Contrived by Sir *William Pettey*.

It hath two *Heads*, two *Ruders*, two *Keels*, two *Holds*, and a Vacancy between them.

From *Stem* to *Stern*, four feet and seven inches long. The *Deck*, about four Feet. From the foremost *Rib* to

the *Rudder*, three Feet and seven Inches. The *Keel* three Feet and about five Inches.

The Beam or breadth of the Ship, sixteen inches, or with respect to the *Keel*, as two to five.

The height of the *Round-House*, or the *Room* in the place of it, three inches and $\frac{1}{2}$. Of the *Great Cabin*, three inches. Of the *Fore-Castle*, as much. The depth of the *Wast* an inch and $\frac{1}{2}$. Of the *Holds*, six inches and $\frac{1}{2}$. Each of them four inches broad. The Vacancy between them, eight inches over. Their inner sides not belly'd, but plain, and perpendicular.

These are the principal Measures; which I thought fit to set down. The great Advantages of this Form, with respect either to the Speed, the Course, the Safety of the Ship, or otherwise, I leave to the Authors own excellent Hand, from whom is expected a particular Account hereof.

An INSTRUMENT, contrived by Sir *Christopher Wren*, to demonstrate, How far against the Wind a Ship may Sail. Shewing, that the Mechanical Power, to which Sailing (especially against the Wind) is reducible, is a Wedge: And that a *Transient Force* upon an *Oblique Plane* will cause the motion of the *Plane*, against the first Mover.

A TERELLA, or an Orbicular Loadstone, about four inches and $\frac{1}{2}$ in Diametre, with the one half immerfed in the Centre of a *Plane* and *Horizontal Table*; so as to be like a *Globe* with the *Poles* in the *Horizon*. Together with 32 *Needles* upon the *Margin* of the *Table*. By which the different respect of the *Needle* to the several *Points* of the *Loadstone*; the reduction of the *Filings* of *Steel* to *Helical Lines*, or near them, by the *Magnetick Effluvia*; and other particulars may be observ'd. Contriv'd by the same Person.

Two DIPPING-NEEDLES. Designed for the taking of *Longitudes*.

A CANOO. Given by Mr. *Hocknel*. A sort of Boat so called, used in *Greenland*, and some other places. Figur'd almost like a *Weavers Shuttle*. The *Wooden-Work* is made up of five slender pieces, running by the length: one, which is round at the bottom or in the place of the *Keel*; and two flat ones in each side: Made steady with small

small bended pieces, set or pricked in cross-ways, instead of *Ribs*: and so ty'd all together with *Fin-Whale-Bone*.

This Wooden-Work is cover'd all over, both below and above, with *Seal-Skins*, sewed together with *Leathern-Thongs*. Saving, that towards the middle, is an Oval Hole, encompassed with a *Rim* about four inches high, big enough for a man to sit down in.

In length, seventeen feet. From the Centre of the said *Hole* or *Seat*, forward, Ten feet; from thence, backward, seven. In breadth at the *Seat*, a foot and $\frac{3}{4}$. In depth, backward, seven inches and $\frac{1}{2}$; forward, a foot; because of the mans feet. And the Boat seems thereby to be carried forward with the more ease: as a Coach, in being hung higher behind. The whole Boat is answerable to a great Bladder, in which, though the Waves dash and beat over it never so much, the man still sits safe.

He makes use but of one *Oare*, about nine feet long. Made of *Ash*, and shaped somewhat answerable to a strong *Bow*. In the middle, an inch and $\frac{1}{2}$ thick, and an inch and $\frac{1}{2}$ broad, by the *Horizontal* measure: towards both ends, about $\frac{1}{4}$ of an inch thick, and two inches and $\frac{1}{2}$ broad, by the *Vertical*. At each end is fasten'd a *Paddle*, here wanting. This *Oare* he holds in the middle, and Rowing with both ends alternately, makes it serve instead of two.

War. A GUN affixed to an Iron Triangle; the middle of the Gun, to one of the Angles; and the Breech, to the middle of the subtended side: and so to be fasten'd to a Floor or steady Frame, either at all the three Corners, or only at one of the hinder. Contriv'd by my Lord Vicount Brouncher, for the making of Experiments of the RECOYLING of Guns. Delineated in the History of the Royal Society: (a) Together with the Experiments made herewith by his Lordship; first before the said Society, and afterwards before the King: set down in a Table of five Columns. The First shewing the Corner stoped from Recoyling; the Second, the different Charges of Powder; the Third, the Distances to which the Bullet was carry'd wide of the mark; the Fourth, the side on which it was carry'd; the Last, the distance of the Mark from the Muzzle of the Gun. As also, the Causes assigned by his Lordship, for the particulars most observable.

An

An ASSAYER to try the strength of *Gun-powder*. Contriv'd by his Highness Prince *Rupert*. Compos'd of two flat, upright and parallel Stands of *Brass*, about a foot and $\frac{3}{4}$ high, with a shallow Indenture on both their inner edges. Upon the Base on which they stand, and between them, is placed a *Powder-Pan*. Over which, a *Slider*, with a thin *Plate-Spring*, which plays against the said Teeth, and two Arms for the charging it with weight at pleasure. The stronger the Powder is, it forceth the *Slider* to a greater height.

A WIND-GUN. Given by Dr. *Wilkins* late Bishop of *Chester*. Compos'd of two Barrels, one within another. To which is fitted a Rod to charge it with Air. At the Breech, where the two Barrels are open one into the other, is placed a *Valve*, to admit the Air into the outer Barrel, as the Rod drives it, and to keep it there.

A Seven-SHOT GUN, or a *Gun* which carries Powder and Bullets, for seven Charges and Discharges to be made presently one after another. Given by *Dudly Palmer Esq;*. Under the Breech of the Barrel, is one *Box* for the Powder. A little before the Lock, another for the Bullets. Behind the Cock, a *Charger*: which carries the Powder from the *Box* to a *Funnel* at the further end of the Lock; opens one *Valve* to let it into the Barrel, and the Priming-Pan; another, to let in the Bullet after it; raises the Cock; and lets down the Steel; all at one time.

An *Indian* Poyson'd DAGGER. About $\frac{1}{2}$ a yard long. The *Hilt* is a sort of Wood, as firm as *Box*. Very curiously carved into a kind of *Antique Head*. The *Neck* by which it joyns to the *Blade*, plated with *Gold*, and embos'd with a Ring in the middle, in which is set some small sparks of *Gems*. The *Blade* about 14 inches long, and an inch broad about the middle; waved in the manner of some *Swords* hung up for *Signs*, and much expanded next the *Hilt*, the better to stay the Hand: where it is also curiously Damask'd with *Gold*. But every where else with white flourish'd Work of the colour of *Silver*. Saving both the Edges, which are left naked, and are very sharp. But that which is most observable is the *Scabbard*, which is one entire piece of Wood (near the colour of the best *Walnut*) with a *Cavity* cut down to the bottom of it answerable to the *Blade*. A

A TAMAHAUKE, or *Brasilian* Fighting-CLUB. Made of *Brasile*-Wood. About an Eln long. The Handle, above two inches and $\frac{1}{2}$ broad; in the middle, two; and four at the other end. Hath two double or square Edges $\frac{3}{4}$ of an inch thick. The broad end wrought on both sides with two *Tables* or *Areas* of small lines obliquely crossed, and fill'd up with a chalky substance to make them appear. In the middle of which, seems to be a rude Representation of some one of their *Idols*, whose help they expect.

A *West-Indian* T A R G E T. Given by *H. Whistler* Esq.

A *West-Indian* BOW, ARROWS, and QUIVER. The *Bow* is made of *Asb.* Near two yards long. In the middle; not an inch broad, but high-back'd and belly'd, *sc.* above an inch, as our *Bows*. But betwixt the middle and the ends, of a different shape, *sc.* above an inch and $\frac{1}{2}$ broad, and not much above $\frac{1}{2}$ an inch thick. The string made of a sort of *Catgut*; but consisting of three of them hard twisted together, looks like thick *Packthread*.

Some of the *Arrows* are almost an Eln long. Made of a fine sort of unjoynted and hollow *Cane*; about the thickness of one of our *Arrows*, and feather'd in the same manner. The *Notch* fortify'd with a *Swath* of *split Quill*, made tite with a fine sort of *Glew*. In the other end of the *Cane*, is fasten'd a brown Stick, about seven or eight inches long, and the *Cane* there kept firm from cracking, with a *Swath* and *Glew*, as the *Notch*. This Stick is usually knoted, for greater strength: and always Arm'd. One of them, with a curious *Shark's Tooth* near an inch long, and indented or ferrated on both edges: a scurvy Weapon. The rest with Bones, Stones, and pieces of *Metal*, usually shaped not much unlike the said Tooth.

The *Quiver* made of the Skin of the Beast, somewhat like the *Pig-Badger*. With a round piece of wood for a Bottom; and in the middle of the wood, an Iron Wrest, to keep it from the ground.

A Pot of MACASSAR POYSON. Given by Sir *Phil. Vernatti*. With this the people of the *Island* commonly poyson their *Arrows*. They have of several sorts; the most dangerous said (a) to be made of the juyce of certain Trees in *Borneo*. But in This are plainly to be seen the Legs
and

(a) *Tavern.*
Ind. Trav.
l. 3. c. 12.

and other Parts of some *Species* of *Cantharides*; which seem to be mixed with a kind of *Corrosive Salt*.

Three *Cane-pieces* $\frac{1}{2}$ a foot long, fill'd with the same *Poyson*.

A *Siam DRUM*. Given by Mr. *John Short*. The Body of it, as it were a great thick Neck'd *Earthen-Jug*, fourteen inches long; the Belly nine over, the Neck four; and with the Bottom out. In the place whereof is spread a thin *Parchment*, made of a *Fishes-Skin*, beset all over with small round knots in strait and parallel Rows. Stretched out tite with numerous little *Braces* made of *Split-Cane*, all spread over the Belly of the *Jug*, and very curiously platted together at both their ends. The Neck of the *Jug* flourish'd round about with a Mould. Both this and the Belly cover'd with a black *Varnish*; and the Neck also with *Red, Green, and Gilt*.

SECT. III.

Chiefly of *MECHANICKS*. Relating to

TRade. An *Arabian BALSAME-BOTTLE*. Given by *Thomas Henshaw Esq.* 'Tis two feet high, and near an Elu in compass. Shaped like a *Long-Neck* used in a *Reverberating Furnace*. Examining it well, I find it made neither of *Glass, Earth, Wood*, or any *Vegetable Body*; but only of *Leather and Parchments*. The inmost *Parchment*, as thick as that us'd by *Scriveners*. Next to which, is another, as thick as the best *Cordovan-Leather*; but as sturdy as *Whale-Bone*. Next to This, another like the Inmost. Over all, is very tite and curiously sew'd a Cover of tan'd *Leather*. The top of the Neck hath a *Ring or Collar*, made only with raming in a kind of *Gummy Earth* very hard between the middle and the utmost Skin. The Stople made of *Firwood*. So much of the *Balsame* which sticks to the sides of the *Bottle*, is of an extraordinary fragrancy: and seems not inferior to that which some *Drugists* sell under the Name of the *Balm of Gilead*.

ASSAY-SCALES, included in a Case with *Glass Panels*; to weigh with, out of the Air. A

A *China* STATERA, in the form of a *Steel-Yard*. The *Chineses* carry it about them, to weigh their *Gems*, and the like. The *Beam* or *Yard* is of *Wood*, round, $\frac{1}{4}$ of an inch over, and a foot in length. Upon it are Three *Rules* of Measure, made of fine *Silver-studded Work*, as in *Watch-Cases*. One of the *Rules* is divided into inches; and every inch into (25) equal parts. The other Two are also divided into equal parts; but not into inches. They all begin from the end of the *Beam*: whence, the First is extended (8) inches; the Second, $6\frac{1}{2}$; the Third, $8\frac{1}{2}$. The first, is our *Europe-Measure*; the other two, I take to be the *China-Measure*, and that of some other Country trading with them.

At the other end of the *Yard* hangs a round *Scale*, marked with a square Seal of *China-Characters*. At Three several Distances from this end, are fasten'd so many slender strings. The First Distance makes $\frac{5}{8}$ ^{ths} of an inch; the Second, is double to the First, or an inch and $\frac{1}{2}$; the Third, two inches and $\frac{1}{4}$.

When they weigh any thing, they hold up the *Yard* by some one of these three strings, and so hang a sealed weight (about an Ounce and $\frac{1}{4}$ *Troy-weight*) upon some point of the *Rule*, as the Thing requires. 'Tis kept in a *Case* fitted to it, almost like a *Dancing-Master's Kit*. There is one like to this in the *Musæum Romanum*. (a)

(a) P. 34.
Col. 2.

A Pair of WOODEN-BELLOWS. Contrived to save *Leather*. Given by Sir *Rob. Moray*. They may be compared to a *Box*; saving, that here the *Box* moves, and strikes not within, but over the *Lid*: and both of a square Figure. The length of the *Box* from end to end, within, two feet. The breadth, at the *Breech*, a foot and $\frac{1}{4}$; the depth, about a foot. The breadth of the *Nose-end*, seven inches and $\frac{1}{2}$. The *Breech-Board* is bended, so as to make part of a *Zone*, answering to the *Lid* (which moves upon an *Iron Centre* or *Axis*) as the *Radius*.

The *Lid* hath a *Margin* placed inward on both sides and both ends. From the inner edge, to edge, longways, nineteen inches; in breadth, at the *Breech*, ten inches; at the *Nose-end*, four. The *Nose*, of *Iron*, like that of an ordinary pair of *Bellows*. The *Valve*, of *Wood*.

On the middle of the said *Margin*, are two Springs on each

B b b

side

side the Lid, and one at each end. Between the two Springs on the sides, and at the four Corners, a kind of half Staple like a *Bench-Hook*. Within or under which are placed squares of Wood, and by the said Springs, kept close to the sides of the Box, (to keep in the Air) as it plays over the Lid.

A ROUPY of *Silver*. Given by G. Ent Esq;

A HALF-ROUPY of *Silver*. By the same Hand. These and divers other like *Coins* are currant all over the Dominions of the *Great Mogul*. I place them here, as not relating to *Antiquity*, but of present known use.

Several sorts of *Indian MONEY*, called WAMPAMPEAGE. 'Tis made of a sort of Shell, formed into small *Cylinders*, about a $\frac{1}{4}$ of an inch long, and $\frac{1}{8}$ th over, or somewhat more or less: and so being bored, as *Beads*, and put upon *Strings*, pass among the *Indians*, in their usual Commerce, as *Silver* and *Gold* amongst us. But being loose, is not so currant.

The meanest is in SINGLE STRINGS. Of which, here is both the White and Black. By measure, the former goes at Five shillings the Fathom; the latter, at Ten. By Number, the former at Six a penny; the latter, at Three.

The next in value is that which is Woven together into BRACELETS about $\frac{1}{4}$ of a yard long; Black and White, in Stripes, and six pieces in a Row; the *Warp* consisting of *Leathern Thongs*, the *Woof* of *Thread*. These *Bracelets* the *Zanksquaes* or *Gentlewomen* commonly wear twice or thrice about their *Wrists*.

The best, is woven into GIRDLES. Of This here are two sorts. One about a yard long; with fourteen pieces in a Row, woven, for the most part, into black and white Squares, continu'd obliquely from edge to edge. The other, not all-out so long, but with fifteen pieces in a Row. Woven into black *Rhombs* or *Diamond-Squares*, and *Crosses* within them. The spaces between filled up with white. These two last, are sometimes worn as their richest Ornaments; but chiefly used in great Payments, esteemed their Noblest Presents, and laid up as their Treasure.

A string of *Virginian MONEY*. A Row of Teeth in shape like the fore-Teeth of a *Hare*: all woven together,

at

at one end, with brown twisted *Thread*, into one Piece $\frac{1}{4}$ of a yard long.

Husbandry. The Frame of a SAFFRON KILN. Given by the Honourable *Charles Howard Esq;* Together with a Description hereof; and the way of Planting *Saffron*, and ordering it upon the *Kiln*. And by Me published in the *Phil. Transactions.* (a)

(a) Num:
138.

The Spanish SEMBRADORE. A Machine for Plowing, equal Sowing, and Harrowing all at once. Contriv'd by *Don Joseph Lucaletto* a Spanish Knight. Used and approv'd both in *Spain* and *Germany*. Given by *J. Evelyn Esq;* together with the Description extracted out of the Authors *Treatise* hereof, and published in the *Phil. Transactions.* (b)

(b) Num.
60.
(c) Apper-
dix to Po-
mona.

A CIDER-PRESS. Described also by *Mr. Evelyn.* (c) Contriv'd by *Mr. Hook.* For better Dispatch, and thorow breaking of the *Apples.* Consisteth chiefly of four *Cylinders.* Those two, which are first to bruise them, more distant; the other, to press out the *Juyce*, as close as will well consist with their motion.

A BOX-HIVE. Given by *Sir Rob. Moray.* But contrived by *Sir Christopher Wren:* And the Description hereof first published (d) in the Year, 1652. Since then by *Mr. Moses Rusden.* Design'd to keep them warmer, and more safe; but especially, to prevent their Swarming, and the better to propagate them into Colonies.

(d) By Mr.
Hartlib.

Houswifery and Household-stuff. CASSAVI-BREAD. Made of the Root of the *Hyjucca Mexicana.* They first pound it, and press out the *Juyce*; which is of a noxious (say some, of a deadly) quality: and the *Pulp* of the Root is reduced to a *Cake.* These *Cakes* they fry, or rather bake over a gentle fire, and so set them in the Sun to dry, for their *Bread.* The thicker *Cakes*, called *Cassavi*, and eaten by the poorer sort. The thinner, called *Sciam Sciam*, by the *Rich.* (e) In *Hier. Benzoni's* time, (f) all the Ships that were bound from *Spain* to *Mexico*; when they returned, were Victualled with *Cassavi-Bread.* That is, instead of *Biscot.*

(e) Aldin.
De script.
Hort. Farnes.
Out of Mo-
nerdes and
Oviedus.

A HAMMOCK. Like a Great Net, with several small *Tassels* on the sides, and two huge ones at the ends. Between which, 'tis fifteen feet long. The *West*, seven feet; and

(f) Histor.
Americ. l. 4.
c. 28.

and about as broad. It consisteth of twisted *Thread*, as thick as small *Packthred*; made of the *Barque* of the *Coco-Tree*, and of the *Rind* of the *Nut*. Not Netted; nor Woven with *Warp* and *Woofe*; but after the manner of *Bobbin-Work*. At both ends, the *West* gather'd up into several small Ropes, and those at last into greater: by which it is commonly fasten'd to two Trees some yards above ground. Thus fitted, the people in some parts of the *Indies*, lie down in them, and so sleep secure from *Serpents* and wild *Beasts*.

A Pattern of the STUFF made by the *Planters* in *New-England*: the *Tarn* whereof they Dey of a kind of *Phileamot*, with a Decoction of the *Barque* of the *Butter-Nut-Tree* (described in the Second Part) without *Alum*, *Copperas*, or any thing else to strike the Colour.

A sort of LEATHER, as thin as that of a *Kid*. Of which it is affirm'd, That it will keep out water better than the best *Neats Leather*. And I have been told, That it hath been us'd in the *French-Camps*, spread upon the ground, for Bedding. It seems to be made, by being thoroughly soaked in a mixture of *Oil* and *Bees-Wax*.

A CUP Turn'd out of *Sassafras Wood*.

A Little BOX Turn'd out of a *Nutshell*.

A JAPAN Wooden CUP: cover'd with a *Red Varnish* within, and with yellowish *Flowers* without, upon a *Black Ground*.

An INDIAN-PAIL. Made of the *Barque* of *Birch-Tree*. Square at the bottom, and thence rising up into a *Conick Form*. So ingeniously contriv'd, that the *Sides* and *Bottom* are all made out of one single piece of *Barque*.

An INDIAN DISH or *Potager*. Made also of the *Barque* of a *Tree*, with the *Sides* and *Rim* sewed together after the manner of *Twiggen-Work*.

Another DISH, cut out of *Wood*, as *Hollow Ware* commonly is here in *England*.

A RUSH-BASKET. The *Rushes* are partly of their *Native colour*, and partly deyed with a *redish* and *brown Tawny*. Very prettily woven together by the *Indian Women*, in *striped* and *indented Work*. And also very oddly: for it seems to have a double *Woofe*, one on each side the *Warp*; the *Rushes* running on the out-side, one way; on the in-side the contrary.

A BASKET made of *Porcupine-Quills*. The Ground is a *Packthred-Caule*; not Netted, but Woven. Into which by the *Indian-Women* are wrought, by a kind of *Lap-Work*, the *Quills* of *Porcupines*, not split, as the Person that sent it affirms, but of the young ones entire: mixed White and Black in Even and indented Waves. Esteemed by themselves as one of their chiefest Curiosities.

ANOTHER, made of the same Materials; but with the *Quills* wrought in *Triangular Chequer-Work*.

An *Indian* COMB. A Stick, whereof somewhat more than one half is cut into three sharp and round Teeth, four inches long. The other part left for the Handle, adorned with fine Straws laid along the sides, and lap'd round about it, in several distinct Swaths.

Cloaths and Ornaments. An *Indian* PERUQUE. Made, not of *Hair*, but *Feathers*, *sc.* black, grey, yellow, red and white: all cut at the tops to the length of about five inches. Saving the fore-Lock, which is made of small ones an inch and $\frac{1}{2}$ deep. Fasten'd to a course *Netted-Caule* of *Packthred*.

An *Indian* MANTLE; Also made of *Feathers*. Given by Dr. G. Smith. About an Elu square. The *Feathers* all of a Brown or *Eagle-colour*, small and wrought into a *Caule* of *Packthred*.

An *Indian* BRACELET for the *Wrist*. Made of the Scarlet *Feathers* of the *Indian Sea-Curlew* (described in the First Part) Clipt short, and woven into a *Caul* of *Packthred* two inches broad. There are also $\frac{1}{2}$ a dozen Tufts of blew *Feathers* in the middle, and two of Black at each end. Much like the usual *Bumbast* of black Bits sewed into *Ermine*, which our *English* Women are made to think very fine.

A Pair of *Iceland* GLOVES. Given by Th. Henshaw Esq;. About $\frac{1}{2}$ a yard long, and $\frac{1}{4}$ broad at the Tops. Made of *Deer-Skin*; not tan'd, but only dry'd, with the Hair on; and lin'd with the same. The Tops faced with *Scarlet Serge*, Embroyder'd with *Flower-Work*, made of *Leaden-Wyre*, twisted (as *Silver-Wyre* on *Silk*) upon brown *Hempen Thread*. I call it *Wyre*, not because it is Drawn, which this Metal cannot be, but for that it is so small. In the vacancies of
the

the Work, are set *Copper-Spangles* with knots of the same *Wyre*.

An *Indian SCEPTRE*. Made, as it seems, of a sort of *Cane*. A yard long; and as thick as a middle *walking-Cane*; without any Joynt, and perfectly round. Consisteth of hard and blackish *Cylinders*, mixed with a soft kecky Body; so as at the end cut *transversly*, it looks as a bundle of *Wires*. Gilt and varnished all over with *Flowers* in Green, Red and White; saving the two ends which are Black.

The FAN of an *Indian King*. Given by *H. Whistler Esq;*. Made chiefly of the Feathers of *Peacocks* Tails; compos'd into a round Form. Bound altogether with a circular Rim, above a foot over, consisting of the parts of certain *Plants* like *split Cane*. The middle strengthen'd and divided into squares with cross Bars, made of the same materials, and some of them deyed Red. The bottom of each Square over-laid with *Moscovy-Glass*. And in the middle of each, a knot of white *Feathers*, like the *Flower* of a *Jacynth*.

A plain *Indian FAN*, used by the meaner sort. Made of the small stringy parts of Roots, spread out in a round flat Form, and so bound together with a *Splinter-Hoop*, and strengthen'd with small Bars on both sides. The *Handle* painted with *Japan Varnish*, black, red, and yellow. When they use them, they sprinkle them with sweet Water, which perfumes the wafter Air.

An *Indian PURSE* or CASE for the *Pudenda* of a Man. 'Tis a foot long, and clos'd at the bottom. Made of small *Reeds* woven together after the manner of coarse *Linnen*.

An *APRON* for the *Pudenda* of a Woman. A $\frac{1}{2}$ of a yard deep, and shaped like a *Widows Peak*. Hath two *transverse Labels*, with several small *Tassel'd Strings*, to tie it about her middle; and a great one hanging down before. Made of *Rushes*, and other *Plants*. The out-side of several colours, *sc.* white, yellow, red, tawny, and brown; as flexible as any *Thread*. Woven in several Squares, and $\frac{1}{2}$ Squares in a most exact and geometrick Order. The inside of smaller *Rushes*, all of one colour, and the Weaving uniform: as some *Silks* are plain on one side, and flowered on the other. A piece of Work, which an *European* could hardly imitate with all her Art.

A

A Pair of *Iceland* BOOTS. Given also by Mr. *Henshaw*. Made of dry'd *Deer-Skin*, as the *Gloves*. Somewhat above a foot long, and about a foot broad at the Tops. The small of the *Leg*, above $\frac{1}{2}$ a foot. The *Foot*, but eleven inches. Lined with another sort of *Skin*, and that only dry'd. The *Knee* faced with coarse red *Cloth*; and the top of the *Foot* with *Lists* of the same; both Embroider'd with twisted *Leaden-Wyre*, like that on the *Gloves*. On the end of the *Toe*, a *Button* made of a *Leathern Thong* knoted in a round form, and wrought over, not with twisted, but plain *Leaden-Wyre*. They are stitch'd together with *Cat-Gut*. How the people use them, I see not; for the very same *Skin*, which is thin, and with the *Hair* on, makes the *Sole*, as well as the *Top*, of the *Foot*, and the *Leg*.

A SNOW-SHOOE, used in *Greenland*, and some other places. Given by Mr. *Linger*. A yard and $\frac{1}{2}$ long, and in the middle fifteen inches broad. Oval behind; the fore-end, sharp. The *Margin* is a piece of *Wood* of the breadth of a *Lath*, reduced to the Form above-said, and so made tite and steady with two cross *Bars*. To the sides round about, is stretched and fasten'd three pieces of woven *Work*, resembling *Net-Work*; made of small *Leathern Thongs*, in three parallel Orders, one directly, and two obliquely *transverse*. In the middle piece is a hole made, to affix It to the *Foot*.

Painting. A LANDSKIP, being the Prospect of a fair City, painted upon Stone.

A Natural *Landskip*, or Prospect of Ruinous Buildings in Stone. Humour'd with a *Tree painted* over it.

Another, with a Woman in a praying posture.

CATOPTRICK PAINT, on a Table or Board. Given by Bishop *Wilkins*. On one side, the *Paint* looks as if it were altogether rude and irregular, so as nothing can be made of it. But a *Metalline Cylinder* being placed perpendicular upon a certain Point of the Table; the *Rays* are in such sort incident thereon, and thence reflected to the Eye, as to represent a variety of curious *Work*: *sc.* a *Shepherd* playing on a *Pipe*; and his Wife dancing with a Child in her Arms, and a Basket on her Head.

On the other side, *St. George* and *Don Quixot* both on Horse-back, and a *Wind-Mill* betwixt them. And *Don* having

having made his *Horse* leap at the *Sail*, his *Horse* hangs upon it, and himself is thrown to the ground. But a *Metalline Octogon*, placed as the *Cylinder*, shews *St. George* in good posture upon *Don's Horse*, killing the *Dragon*.

An Instrument to draw PERSPECTIVE with. Contriv'd by *Sir Christopher Wren*.

An Optique BOX, used as a help in DRAWING.

A piece of SMALT-GLASS. Used by *Painters* for *Picture-Frames*, and other purposes. Given by *Mr. J. Linger*.

The Picture of a MUSK-DEER, in Colours, and after the Life. Taken in *Java major*, and sent from thence by *Sir Philiberto Vernatti*.

The Picture of a BASILISK. Pretended by those that shew it, to be a real *Animal* so call'd. But is an Artificial Thing, made chiefly of the Skin of the *Raja*, and the Legs of a *Dodo*, or some great *Fowl*. Given by *Ellis Crisp, Esq;*

The Picture of the Plant called NINSIN. The whole Plant is drawn after the Life on *Parchment*, in Colours. The Root, of a redish yellow; about five or six inches long, and near as thick as a *Skirret*: agreeing with the Description hereof in the Second Part of this *Catalogue*. The Stalk as thick as a *Wheaten-straw*, and a foot high. The Leaves somewhat like those of the *Stock-Gilly-Flower*. The Flowers redish in the Bud, and white when open; three and three together, and composed of six round Leaves, like those of the *Round-Flower'd Moly* figur'd in *Bauhinnus*, but not so big.

The Draughts of several *Indian PLANTS* on a Table. In the first place, of

The CLOVE-TREE: Together with a Branch of the same after the life: The Mother or *Prolifick-Clove*, from which the *Plants* are propagated: And the Stone and Kernel of the same. Next of

The NUTMEG-TREE: Together with a Branch of the same after the life: The Fruit of the *Female-Nutmeg*: Of that called the *Thieving-Nutmeg*, because it infects and spoils the good ones where it lies: The *Male*, with its Fruit, both long and short: And the little Kind, wherewith the *Natives* dey their Teeth black. Next of

A PLANT which beareth a Fruit hanging with a long Stalk

Stalk upon the top of the Leafe; almost in the shape of a *Can*, with its Lid. If it be open'd, though the Weather never so hot, 'tis half full of Liquor. Then of

A SAGEWAR-TREE; whose *Flower* being cut, renders a Juyce like *Wine*, far above the *Coco-Tree*: With the Fruit both of the *Male* and *Female*. In the last place, of

The SAGOUS-TREE; which those that inhabit the *Molucca* Islands, eat instead of Bread: With the Fruit, after the life.

Design. An Armed SOULDIER, in the posture of fighting. Together with a *Landskip*, and the *Prospect* of an *Army*. Given by Mr. *Will. Brownest*; and all very curiously Drawn with his Pen.

Wrighting. A Jewish PHYLACTERY. This here is only a single Scroll of *Parchment*, $\frac{3}{4}$ of an inch broad, and 15 inches long; with Four Sentences of the *Law*, (*viz.* *Exod.* 13. from 7. to 11. and *f.* 13. to 17. *Deut.* 6. *f.* 3. to 10. and 11. *f.* 13. to 19.) most curiously written upon it in *Hebrew*. *Serarius*, from the *Rabbies*, saith, That they were written severally upon so many Scrolls. And that the *Jews* to this day, do wear them over their Foreheads in that manner. So that they are of several sorts or modes, whereof this is one.

The original use of them, for *Memento's*: grounded on that Command, (a) *And thou shalt bind them for a sign upon thine Hand, and they shall be as Frontlets between thine Eyes.* But afterwards, served more for Ostentation. And at last, for *Spells* or *Amulets*. (b) From whence also the use of *Charms* amongst *Christians* was first learn'd; and those who gave them called *Phylacterij*. Prohibited by the Council in *Trullo*. (c)

(a) *Deut.* 6. 8. and in the other places above quoted.

(b) *Hierome*, quoted by *Bishop Montague*.

(c) *Can.* 61.

An Example of the ARABICK Letter in one or two Variations upon *Parchment*.

An Example of the CHINA-Language, in a considerable Variety of CHARACTERS, upon two sorts of *China* Papyr.

An Example of the MALABARINE Letters and Language. The Letters have some little resemblance to those of the *Coptick*. Written upon a single Plate of the *Palmetto-Leaf*, an inch and $\frac{1}{2}$ deep, and 10 inches long. It seems, from the Hole punched at the end of it, to have been

C c c

filed

filed with a great many more, and so to have made a Book.

Another Variety of the ARABICK Letter, not properly *Written*, but *Impress'd* with a Style, or as it were Engraven, upon two double *Plates* of the *Palmetto-Leaf*.

Sculpture. A CARVED Shell of MOTHER of *Pearl*. On which *Andromeda* stands naked upon the Shore, having her Arms fasten'd to a Rock with two Chains. Near the Shore, a great *Sea-Fish* or *Monster* making towards her, and spouting out Water at *Perseus*. Who comes flying upon *Pegasus*, with his Shield, and his Sword advanced, to kill the *Monster*. Upon a *Promontory* between *Andromeda* and *Perseus* stands a *Cupid*, and among the Trees upon it another, signifying their Marriage afterwards. All done with extraordinary Art.

ANOTHER, with the same curious Work, but different Phancy. *Neptune* making towards the Shore, without his Mace, advances and spreads abroad his Arms, in Courtship towards *Diana*. Who stands on the Shore in her Mantle half naked, and holding forth her Hand in the posture of denial. Between them, two naked *Nymphs*, one giving aim to the other, shooting a Dart at *Neptune* to give him a further repulse. And a *Cupid* flying away over *Dianas* Head.

About 36 pieces of *Ivory*, with IMAGES CARVED upon Each. On some, of Men; on others of Women and Children; and on others, of Cattel. One of them, a *Crucifix*, with the Eleven Apostles. They seem to have belonged to a *Cabinet* or *Chest of Drawers*, and to make some story; but the rest being wanting, unintelligible.

One of them, is a curious piece of Work. On the top of a Rock, stands a Castle. At the foot, a *George* or *Chevaleer*, armed and mounted, and combating a *Dragon*; defending her self, and shewing her rage in a most lively posture. Behind the Horse stands one of her young Ones, expecting her Conquest. On the brow of the Rock, a Woman, or if you will the Lady, praying for her overthrow. Hereto may be refer'd,

A SEA-PIECE, consisting wholly of INLAY'D-WORK, of several Colours, in *Stone*. As also,

A FORREST, with a House at the end of it; and several Beasts

Beasts both wild and tame, as the *Lion*, *Unicorne*, *Boar*, *Camel*, *Stag*, and a *Dog* pursuing him: all Cut in PAPER, in the compass of about three inches square.

Turn'd Work. A Box of CUPS, from *Norimberge*: being an Hundred of them one within another; the Boll of the utmost about two inches and $\frac{1}{2}$ in Diametre. Given by *Dudley Palmer Esq;*. I take the Wood to be *Maple*.

A piece of TURN'D Work in *Ivory*. Given by *H. Olden-burge Esq;*. A solid Triangle, turn'd open on the four sides. With a *Flower* standing out on each side, and loose. In each *Flower*, a little Spike, also loose. But all the four *Flowers* by themselves, and so the Spikes, are united in the centre. On the Necks of the *Flowers* likewise hangs a Sphærical Triangle; and on each Neck, several small Rings. Preserved in a Round *Ivory Box*.

The HEAD of a Princess, in her HAIR, and with a CORONET; in an Oval of *Ivory*. That which is extraordinary, is, That it is not CARVED, but all TURNED Work. 'Tis kept in an Oval Box, wrought with Undulated Work of several Forms, all likewise Turn'd. The Art, I think, is now dead with the Author.

Molded-Work. Two HALF BODIES in Armor, betwixt four and five inches in length. Given also by *Mr. Dudley Palmer*. The phancy is this, That upon a rude molded Ground of *Rosin* and *Wax*, or some such substance, are laid, chiefly the parts of several *Plants* and *Insects*, by which the Figure is compleated. As the Forehead, (all the Face of one) with the Scales of the Belly-Piece, of the Broad Golden *Cantharis*; the Ball or White of the Eye, with *Gromwell-Seeds*; the Lids, with those of a sort of *Marigold*; the Nose, with that of *Carthamum*; the Beard with those of *Lettice*. Part of the Armor, of one, with the *Wing-Sheaths* of the Green Broad *Cantharis*: of the other, with the *Seeds* of *Cow-Parsnep*: and so for the rest. A couple like to These, are figur'd in *Olearius's Musæum*.

Sir Robert Moray's HEAD in WAX. Taken off of a Plaster-Mold, which was made upon it.

SECT. IV.

Of COYNS, and other Matters relating to Antiquity.

THe Effigies of JOHN HOWARD, the first Duke of Norfolk, in Colours Neald on *Glass*. From whom the Right Honourable the present Duke of Norfolk is the eighth, inclusive. Given by Mr. S. Morgan. He is represented kneeling in a *Chappel*, with his Dukes Cap by him, and Invested in his *Coat of Armour*, bearing four Coats, Quarterly: sc. of Howard, Brotherton (Son to King Edward the First) Plantagenet (Earl of Warren and Surrey) and Fitz-Allan. The first, is Gules, a Bend betwixt six Crosslets fitchy, Argent. The second, the Arms of England, with a Label of three Points Argent. The third Checky Or and Azure. The fourth, Gules, a Lion Rampant Or.

The PEDEGREE of the most Noble Family of the HOWARDS, from the first Duke above-said: Engraven on a Copper-Plate. Given by the same Hand.

A ROMAN URNE, of Glass, with a Handle. Given by Sir Christopher Wren. Above fifteen Hundred years old. Almost like a Bottle containing a Gallon and $\frac{1}{2}$; but with a very short Neck, and wide Mouth, and of whiter metal. Encompassed girth-wise, with five parallel Circles. Found in Spital-Fields.

STONES, not long since found near the Foundation of Charing-Cross at a great depth. Given by Sir Joseph Williamson. They seem to be a sort of coarse Marble. Of a blackish colour, and figur'd into several plain sides; but irregular: from whence they may be argu'd to be very ancient.

A Piece of MOSAICK WORK, found deep under ground, in Holbourn near St. Andrews Church. Inlaid with black, red, and white Stones, in Squares and other Regular Figures.

A parcel of little square Stones, belonging to MOSAICK-Work, found in a Field near Bath, in the Year, 1664.

Several Examples of MORTARS of old Castles and Roman Buildings. Given by John Aubrey Esq; for comparing them with those now in use.

A ROMAN MONEY-POT. Given (with the Coin below mention'd) by the same Hand. Found in the Year, 1651. in *Week-Field*, in the Parish of *Hedington*, in *Wiltshire*; half full of *Roman Coin*, *Silver* and *Copper*, of several Emperors near the time of *Constantine*. Of the colour of a *Crucible*, and fashion'd almost like a *Pint Jug* without a Neck. Closed at the top, and having a Notch on one side, as in a *Christmas-Box*. In the same place (where anciently was a *Roman Colony*) and at the same time, were dig'd up the Foundations of several Houses for a Mile together.

Of COYNS.

Most of them being obscure, lest I should mistake, I presently took the help of my Worthy Friend Mr. *Abraham Hill*, Fellow of the *Royal Society*, very well acquainted with This, as well as other parts, of Antiquities.

Silver.

Twenty SILVER DENARII; whereof Nineteen given by Sir *Paul Whichcote*. The

- I, II, and III. *Consular*.
- IV. *Imp. Otho Cæsar Aug. Trib. Pot.*
Reverse. *Securitas P. R.*
- V. *Aulus Vitellius Imp. Germ.*
..... *Augusti.*
- VI. *Cæsar Vespasian.*
..... *Tr. Pot.*
- VII. *Cæsar Aug. Pater Patriæ.*
Princ. Juvent. Cæs.
- VIII. *Imp. Cæs. Domit. Germ. Pont. Max. Tr. P.*
Imp. iiij. Cos. xv. Censor. P. iiij.
- IX. *Imp. Cæs. Trajan, Hadrian Aug.*
P. M. Tr. P. Cos. iiij. Felicit. P. R.
- X. *Imp. Cæsar Trajan Hadrian. Aug.*
P. M. Tr. P. Cos. iiij.
- XI. *Hadrianus Aug. Cos. iiij. P. P.*
Romulo Conditori.
- XII. *M. Commodus Anton. Aug. Pius.*
Tr. P. viij. Cos. iiij. P. F.
- XII. *M. Commodus.*
..... *Cos. Exerc.*

XIV.

- XIV. *Severus Aug. Parthic. Max.*
Restitutor Urbis.
- XV. *Cæs. Marc. Anton. Gordianus African. Aug.*
Princ. Juventutis.
- XVI. *Maximus Cæsar German.*
Pietas Aug.
- XVII. *Dom. Nost. Julianus P. (i. e. pius) F. (i. e. felix) Aug.*
(Julian the Apostate.)
Votis x (i. e. Decennialibus) multis x.
- XVIII. *D. N. Valentinianus P. F. Aug.*
Urbs Roma. Lug. P. C.
- XIX. *R. N. Valens P. F. Aug.*
Restitutor Reip. P. Lug.
- These from Sir Paul Whichcote.
- XX. *D. N. Valens P. F. Aug.*
Urbs Roma Tr. P. (Treviris Perc.)
- Given by Walter Chetwynd Esq;
- XXI. *Henricus IV.*
Dominus Hiberniæ. Commonly call'd an Irish Groat.
- XXII. *Carolus V. . . . L. M.*
. . . . Indiarum Plus Ult. In whose time the Indies
were more fully discover'd. These two given by G. Ent Esq;
Copper.
- I. *D. N. Constantius P. F. Aug.*
Fel. Temp. reparatio.
 Two more of the same.
- II. *D. N. Magnentius P. F. Aug.*
Felicitas Reipublicæ. These from J. Aubrey Esq.
- III. *Constantinus P. F. Aug.*
Soli Inviſto Comiti.
- IV. *Constantinus Nob. Cæs.*
Vot. x. Cæsarum nostrorum. S. Tr. (i. e. Sign. Treviris.)
- V. *Constantinus Aug.*
. . . Tranquillitas Vot. xx. The same again.
- VI. *Constantinus Jun. Nob. C.*
Vot. x. nostror. Cæsarum. These found near Cambridge.
- VII. *Antonius Pius Aug.*
Virtus Augg. (Augustorum) } Denarius.
- VIII. *. . . . Tit. Ael. Hadr. Antoninus Aug. Pius.*
Cof. iij. S. C. (i. e. Senat. Conf.) Annona.
- IX. *D. N. Constantinus P. F. Aug.*
Fel. Temp. Reparatio. X.

X. D. N. Magnentius.

Felicitas.

XI. D. N. Magnentius.

Salus DD. NN. Aug. & Cæs. A. Ω.

XII. D. N. Constantius.

Salus DD. NN. Aug. & Cæs. A. Ω. Of these two last together, here are 24, all with the same Revers, about P the Initial Letters of ΧΡΙΣΤΟΣ.

XIII. Constantius P. F. Aug.

. *Exercitus*.

With Nine more obscure. These were taken out of the Pot above mention'd, found near Hedington.

XIV. . . . Ptolomy.

.

XV. Divus Aug. S. C.

Consensu Sen. & Eq. Ord. PQR.

XVI. Divus Augustus.

Providentia S. C.

XVII. M. Agrippa. . . . Cos.

.

XVIII. C. Cæsar Aug. German. P. M. Tr. Pot.

Vesta. The same again.

XIX. Tib. Claud. Cæs. Aug. P. M. Tr. P. Imp.

Constantia Augusti. The same again.

XX. Tib. Claud. Cæs. Aug. P. M. Tr. P. Imp.

. S. C.

XXI. Drusus Cæs. Tiber. Aug. F. Divi Aug. N.

Pontif. Tribun. Potest. iterum.

XXII. Imp. Nero Cæs. Aug. Pon. M. Tr. P.

Roma. . . . S. C.

XXIII. Nero Claudius Cæs. Aug. Germ. P. M. Tr. R.

Mac. Aug. S. S. (Macellum.)

XXIV. Serg. Galba Imp. Cæs. Aug.

Adlocutio.

XXV. A. Vitellius Imp. German.

Fides Exercituum S. C.

XXVI. A. Vitellius Germ. Aug. P. M. Tr. P.

S. C.

XXVII. Imp. Cæs. Vesp. Aug. P. M. Tr. Cos. viij.

. S. C.

XXVIII. Cæsar Vesp.

. S. C.

XXIX.

- XXIX. *Imp. Cæs. Domit. Aug. Germ. Cos. xvj. Cens. Perp.*
Moneta Aug. The same again.
- XXX. *Imp. Cæs. Magnentius.*
Felicitas Reipublicæ. A Souldier holds in his right hand, a Victory ; in his left, the Standard, on which is P as on the XII.
- XXXI. *D. N. Decentius.*
Salus DD. NN. Aug. & Cæs.
- XXXII. *D. N. Magnentius P. F. Aug.*
Salus DD. NN. Aug. & Cæs.
- XXXIII. *D. N. Decentius Cæs.*
Salus DD. NN. Aug. & Cæs.
- XXXIV. *Urbs Roma.*
- XXXV. *Constans.*
Fel. Temp. Reparatio.
- XXXVI. . . . *Constantius.*
Fel. Temp. Reparatio. Of these two last together, here are 43, all with the same Reverse.
- XXXVII. *D. N. Magnentius P. F. Aug.*
Gloria Romanorum.
- XXXVIII. . . . *Philip.*
Miliarium Sæculum Cos. iij. When Rome had been built a Thousand years.
- XXXIX. . . . *Aurelius Anton.*
. *S. C.*
- XL. *D. N. Theodosius P. F. Aug.*
Gloria Exercitus.
- XLI. *D. N.*
Reparatio Reipub.
- XLII. *Constans Pius Aug.*
Virtus Exercit.
- XLIII. *D. N. Honorius.*
.
- XLIV. *Crispus Nob. Cæs.*
. . . . *Tranquillitas.*
- XLV. *Gallienus Aug.*
.
- With about 72 more, which are obscure.
Paper or Pastboard-Money.
Lugdunum Batavorum.
Pugna pro Patria. 1574. When besieged by the Spaniards. Appendix.

Appendix.

Of some Particulars lately given by Dr. Christopher Merret.

TO which I shall only premise a Note concerning the CLYSTER-BAG, described *p. 239.* of this *Catalogue*; but should have been placed in the last Part. 'Twas given by Sir Rob. Southwell; of whom I lately learn, That the *Portugal Negros*, having rowled a lump of Clay into the shape mention'd *p. 239.* they cut the Branches of a certain Tree which yields an *Oily Gum*, and so turn the Clay round, as the *Gum* drops upon it, till it hath cover'd it all over like a thick Skin; which being dry'd in the Sun, will be almost as tough as *Leather*. Then picking out the Clay, it serves them for a *Bladder*. To which they tie the Shank of a *Hare* for a Pipe: and so filling it with Sea-water, as often as they feel themselves much chafed with heat, put it up for a *Glyster*. These Bags they commonly hang by their sides, to be always ready for their use.

The Particulars given by the Doctor are these that follow; with the Descriptions, in his own words.

SAGU. A *Gum*, so called. It comes from the Islands of *Malacca*. It drops from the Trees in small roundish Grains, of the bigness of *Turnep-seed*, but whitish. Chewed, it tasteth somewhat clammy. Boil'd in water, exactly represents *Frog-Sperm*; and in consistence, comes nearest to *Gum Tragaganth*. 'Tis used in *Medicine* and *Diet*.

TERRA JAPONICA. Call'd also *Catechu*, *Categu*, and *Casheu*. 'Tis a *Gummo-Resina*. For most of it will dissolve in Water; and some parts of it only in *Rect. Spirit of Wine*. Most of it contains a great deal of Earth; the reason of the Name. 'Tis cover'd with a rough brown Coat; within which it comes near the colour of *Aloe*; but darker, and

D d d

with

with brown earthy Particles intermix'd. The Taste Astringent and very Dry. The Tincture of a bright Claret colour. An useful and effectual Medicine; and not ungrateful.

POCO SEMPIE. A Golden Moss, consisting of most fine, soft and flexible Threads. Accounted a great Cordial. And said wholly to dissolve in the Mouth; and seem'd so to me, in barely chewing it: but the contrary upon Experiment; which was thus: I ty'd some of it in a Cloath; and chew'd it; keeping it in my mouth a whole Night: but in the Morning, I found no diminution, nor alteration. So that chewing only unfolds it, and then 'tis insensibly swallow'd with the Spittle.

RIZAGON. A Root brought from *Bengala*, of good use. Cut into flat pieces, of a whitish colour, bitterish and aromatick Taste; and hath very large *Fibers*.

CAROLINA. A long red Root, so call'd, from the Place from whence it comes. It draws on Paper red Lines. Answers not expectation, as to deying.

SADORE, or Bitter Wood. It hath a brownish Barque: the Wood yellowish, and exceeding bitter. If it be sliced long ways, you will find very white *Fibers* running by the length.

(a) P. 2.
P. 356.

(b) Pinax,
409. b.

CAIUMANIS *Olearij*. (a) By the Sea-men, *Caiomanes*. By the Portugese, *Canella de Mato*. An *Canella Crassiori Cortice*. (b) This Barque above $\frac{1}{2}$ of an inch thick. Distill'd, it affords a somewhat harsh and rough Liquor. But by Infusion, makes an *Aromatick* and grateful syrup.

SALT of Soap-Lees. An *Exotick*. Found in some quantities on the sides of the *Boylers*. I have yet made no trials of it.

TEUTENAGE. A sort of *Speltar*, as many Experiments shew. Hereof *Parallellepipedon* Vessels are made in *Japan*, wherein their *Thea* is brought over.

I have several other *Rarities*, which, when I see what is wanting in the *Societie's Musæum*, I shall add to it.

Most of these Things were communicated by Mr. *Samuel Clark*, learned, judicious, experienced in all things Natural and Artificial which are brought to the King's Warehouse in the Port of *London*, whereof he is *Surveyor*.

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*A List of those who have Contributed to this Musæum :
excepting some Names which are lost.*

His Highness Prince RUPERT, Count Palatine of the Rhine.

T <i>Thomas</i>	<i>Allen M. D.</i>	<i>Fath. Hieronim.</i>	<i>Lobus.</i>
<i>John</i>	<i>Aubrey Esq;</i>	<i>Richard</i>	<i>Lower M. D.</i>
		<i>Martyn</i>	<i>Lyster Esq;</i>
<i>WILLIAM L. Visc.</i>	<i>BRQUNCKER.</i>		
<i>Hon. ROBERT</i>	<i>BOYLE, Esq;</i>	<i>Mr. John</i>	<i>Malling.</i>
<i>Dr. Erasmus</i>	<i>Bartholine.</i>	<i>Sign.</i>	<i>Malpighi.</i>
<i>John</i>	<i>Bembde Esq;</i>	<i>Christopher</i>	<i>Merret M. D.</i>
<i>Sign. Paul</i>	<i>Boccone.</i>	<i>Sir Thomas</i>	<i>Millington.</i>
<i>Monf. Olaus</i>	<i>Borrichius.</i>	<i>Sir Jonas</i>	<i>Moore.</i>
<i>Joseph</i>	<i>Bowles Merch.</i>	<i>Sir Robert</i>	<i>Moray.</i>
<i>Sir Thomas</i>	<i>Brown</i>	<i>Mr. S.</i>	<i>Morgan.</i>
<i>Edward</i>	<i>Brown. M. D.</i>		
<i>JONH late Lord B. of</i>	<i>CHESTER.</i>	<i>HENRY Duke of</i>	<i>NORFOLK.</i>
<i>EAST-INDIA</i>	<i>COMPANY.</i>	<i>Walter</i>	<i>Needham M. D.</i>
<i>ROYAL AFRICAN</i>	<i>COMPANY.</i>	<i>Isaac</i>	<i>Newton Math. Prof.</i>
<i>Walter</i>	<i>Charleton M. D.</i>	<i>Henry</i>	<i>Oldenburge Esq;</i>
<i>Walter</i>	<i>Chetwynd Esq;</i>	<i>Philip</i>	<i>Packer Esq;</i>
<i>Andrew</i>	<i>Clench M. D.</i>	<i>Dudley</i>	<i>Palmer Esq;</i>
<i>Samuel</i>	<i>Colepress, Esq;</i>	<i>Sir William</i>	<i>Petty.</i>
<i>Thomas</i>	<i>Cox, Esq;</i>	<i>Robert</i>	<i>Plot L L. D.</i>
<i>Edward</i>	<i>Cotton M. D.</i>	<i>Walter</i>	<i>Pope M. D.</i>
<i>Thomas</i>	<i>Crispe Esq;</i>	<i>Thomas</i>	<i>Povey Esq;</i>
<i>Ellis</i>	<i>Crispe, Esq;</i>		
<i>William</i>	<i>Crone M. D.</i>	<i>SETH Lord B. of</i>	<i>SALISBURY.</i>
		<i>Mr.</i>	<i>Scotto Merch.</i>
<i>John</i>	<i>Evelyn Esq;</i>	<i>Mr. John</i>	<i>Short.</i>
<i>George</i>	<i>Ent Esq;</i>	<i>Sir Philip</i>	<i>Skippon.</i>
		<i>Francis</i>	<i>Slare M. D.</i>
<i>Captain Thomas</i>	<i>Fissenden.</i>	<i>George</i>	<i>Smith M. D.</i>
		<i>Mr. John</i>	<i>Somner.</i>
<i>Nebemjah</i>	<i>Grew M. D.</i>	<i>Sir Robert</i>	<i>Southwell.</i>
		<i>Dr.</i>	<i>Swammerdam.</i>
<i>Hon. CHARLES</i>	<i>HOWARD of N. Esq;</i>	<i>Captain</i>	<i>Tayler.</i>
<i>Theodore</i>	<i>Haac Esq;</i>	<i>George</i>	<i>Trumbal T. D.</i>
<i>Thomas</i>	<i>Henshaw Esq;</i>	<i>Edward</i>	<i>Tyson M. D.</i>
<i>Abraham</i>	<i>Hill Esq;</i>		
<i>Mr.</i>	<i>Hocknel.</i>		
<i>Luke</i>	<i>Hodgson M. D.</i>	<i>WILLIAM late L.</i>	<i>WILLOUGHBY of</i>
<i>Robert</i>	<i>Hook Geom. Pr.</i>	<i>Sir Christopher</i>	<i>Wren P. R. S.</i>
<i>Anthony</i>	<i>Horneck B. D.</i>	<i>George</i>	<i>Wheeler Esq;</i>
<i>Sir John</i>	<i>Hoskins.</i>	<i>Daniel</i>	<i>Whistler, M. D.</i>
<i>John</i>	<i>Houghton Pharm. L.</i>	<i>Henry</i>	<i>Whistler Esq;</i>
		<i>Sir Joseph</i>	<i>Williamson.</i>
<i>Edmund</i>	<i>King M. D.</i>	<i>Francis</i>	<i>Willughby Esq;</i>
<i>Monf.</i>	<i>Lannoy.</i>	<i>John</i>	<i>Wintthrop Esq;</i>
<i>Mr.</i>	<i>Langerman</i>	<i>Robert</i>	<i>Witty M. D.</i>
<i>Mr.</i>	<i>Linger.</i>		

THE
Comparative Anatomy
OF
Stomachs and Guts.
BEGUN.

BEING SEVERAL
LECTURES

Read before the

ROYAL SOCIETY.

In the Year, 1676.

By *Nehemiah Grew* M. D. Fellow of the *Royal Society*,
and of the *Colledge of Physitians*.

LONDON,

Printed by *W. Rawlins*, for the Author, 1681.

An Advertisement to the Reader.

WHereas a Book Entitul'd, *Exercitatio Anatomico-Medica de Glandulis Intestinorum, earumq; Usu & Affectibus. Cui subjungitur Anatome Ventriculi Gellinacei. Studio Joh. Conradi Peyeri Scahsusa-Helvetij, 1677.* In which are found some of those Observations contained in the following Lectures. It was therefore thought fit, here to take Notice, That the said Book was not Published, till the Year after these Lectures were Read.

CHAP. I.

Of the Stomachs and Guts of Six Carnivorous Quadrupeds; sc. The Weefle, Fitchet, Polecat, Cat, Dog and Fox.

I Am not ignorant of what many Learned and Inquisitive Men, both at home and abroad, especially in this last Century, have performed in the Anatomy of Animals. After all whom, if it be demanded, what is left for me to do? I Answer in the words of Seneca, (a) *Multum adhuc restat operis, multumq; restabit; nec ulli Nato, post mille Sæcula, præcludetur occasio, aliquid adhuc adjiciendi.* (a) Epist. 64.

I shall omit most of what is already noted by Anatomists; and principally speak of those things, which have hitherto been unobserv'd.

A Weefle.

The Gullet of a Weefle (which from the Ears to the setting on of the Tail was 10 inches) about five inches long, $\frac{1}{2}$ in Diametre, equally wide, and thin. Enters the Stomach at the left End.

The Stomach about three inches long; proportionably, more than a Dogs. An inch in Diametre at the upper Orifice; at the nether, $\frac{1}{2}$; having a flexure towards its Conjunction with the Guts: shaped like to the body of a pair of Bag-Pipes. Thin, and plain, or without Folds. Which seems to be the property of the Stomachs of most Rapacious Quadrupeds.

The Guts thin, and plain, or with little store of Glands, especially of such as in most Carnivorous Animals are conspicuous. About a yard in length, and $\frac{1}{2}$ an inch in Diametre; without any considerable contraction, difference of Size, Texture or Substance from the Stomach to the Anus. No Colon. No Cæcum. So that it seems to be all but One single Gut. Contrary to what is seen in any other Quadruped, I have opened.

At the Anus, a Couple of Bags grow to the Gut; one
A on

on each side. Each of them, fill'd, about the bigness of a large *Garden-Peas*: containing a yellow, and thickish Liquor, extraordinary *fætid*, and having the peculiar scent of the Animal in the most intense degree. Over the *Bags* or *Bladders*, is spread the *Sphincter-Muscle*; which compressing *Them* and the *Anus* both together, forceth them to a contemporary evacuation.

I have not yet dissected the *Civet-Cat*, but suppose, that these *Bags* are analogous to those that contain the *Civet* in that Animal.

These *Bags*, so far as I have observ'd, are proper to all *Carnivorous Quadrupeds*, and those only: as will further appear by the following Examples.

A Fitchet.

A FITCHET, being of kin to the *Weefle*; hath also a *Stomach* and *Guts* much alike.

The *Guts* about a yard and two inches. At most, but two. The first, about two feet and $\frac{1}{2}$ long; and $\frac{3}{8}$ ^{ths} of an inch over, where widest. Hath five or six Necks or Contractions. And a little before most of them, stands a small Cluster of *Glands*, about as big as a *Silver Half-peny*. The second, is about $\frac{1}{2}$ a quarter of a yard long, and $\frac{1}{2}$ an inch over where widest. Very thin, plain, and without any *Glands* visible to the bare Eye.

On each side the *Anus*, there is also a Bag of *fætid* Liquor, with the stink of the Animal.

The *Guts* of these Two Animals, and I suppose likewise of the *Ferret*, are the most simple, and plain, of all I have observ'd in *Quadrupeds*.

A Pole-Cat.

The *Gullet* and *Stomach* of a POLE-CAT, are in shape like those of a *Weefle*. But the *Guts* are different.

They may be reckon'd, four. The first, about $\frac{3}{4}$ of a yard long; $\frac{1}{2}$ an inch over; very thin, and plain.

The second, $\frac{3}{4}$ of a yard in length; $\frac{1}{2}$ of an inch over, and in some places more. This *Gut* is Glandulous and very thick, in comparison with the other, from end to end. The
Glands

Glands extream small, no bigger than little *Pins heads*. Yet every Gland hath its *Orifice*, out of which a *Mucus* or *Pituita* may be visibly squeez'd.

The Third, is $\frac{1}{2}$ a yard long; and about $\frac{1}{2}$ an inch over, as the first. About the middle hereof, is a *Cluster* (of petite *Glands*) about two inches long, and $\frac{1}{2}$ of an inch broad. At the further end also, joyning to the fourth *Gut*, is another like *Cluster*, but as broad again. Each Gland in both these *Clusters*, is about the bigness of a *Mustard-Seed*.

Each of these *Clusters*, may be called a little *PANCREAS INTESTINALE*. Their difference is, That This hath not one common *Ductus*.

Of these *Clusters*, it is observable, That both here, and in all the other Animals hereafter mention'd, they stand directly opposite to that side of the *Gut*, into which the Vessels are inserted.

The Fourth, or *Rectum*, is separated from the former by a Contraction. Almost five inches long; and near the *Anus*, $\frac{3}{4}$ of an inch in Diameter. So that all the *Guts* together, are two yards, within $\frac{1}{2}$ a quarter.

This Animal hath neither *Colon*, nor *Cæcum*.

At the *Anus*, a pair of *Bladders* grow to the *Gut*, as in a *Weefle*; containing also a Liquor with the peculiar *fætor* of the Animal, most intense.

A Cat.

The *Gullet* of a well grown CAT, $\frac{3}{4}$ of an inch, where widest. The Texture two-fold. The *Muscular Fibers* of the upper half next the Throat, plainly *Platted*. A sort of Work, which will best be seen in the *Gullet* of a *Sheep*. Those of the other half, rather *Annular*, though not exactly so.

The *Stomach* in shape like that of a *Dog*, and most other *Carnivorous Quadrupeds*; only somewhat shorter and rounder; being not above five inches long, yet $3\frac{1}{2}$ over.

But in the *Guts* divers Specialties are observable. Altogether, about two yards and $\frac{1}{2}$ long. With respect to their substance, but two in number: To their shape, the first may be subdivided into four.

This first may be called *Musculare*: being in proportion, thicker or more carneous than the *Guts* of any *Quadruped* I have open'd.

It hath about 28 or 30 *Contractions*; some an inch, others two or three inches distant one from another. I have not seen a quarter so many in any other Animal. It may be subdivided into four.

The First, *i. e.* from the *Stomach* to the place where the *Gut* is considerably amplify'd, about $\frac{1}{2}$ of a yard; and somewhat more than $\frac{1}{2}$ of an inch, over.

The Second, *i. e.* to the place where more conspicuously contracted, about $\frac{1}{2}$ a yard; and in its widest place, above $\frac{1}{2}$ an inch, over.

The Third, *i. e.* to the next greater dilatation, a yard and $\frac{1}{8}$ th; and $\frac{3}{8}$ ^{ths} of an inch, over; near the same width with that of the first.

The Fourth, about $\frac{1}{2}$ a yard and $\frac{1}{8}$ th; and $\frac{1}{2}$ inch, over. So that two slender, and two ample ones are reciprocally joyn'd.

This *Intest. Musculare*, is furnished with several *Clusters* of *Glands*, six or seven in number: each *Cluster* about $\frac{1}{4}$ of an inch long; and the last above three inches. This especially, as in the *Pole-Cat*, may be called *PANCREAS INTESTINALE*.

The Next *Gut* (in the place of the *Rectum*) may be called *Membranaceum*, in distinction from the former; being far more perspicuous and thin. About $\frac{1}{2}$ a yard long; and where widest, an inch and $\frac{1}{4}$, over. So that its hollow is more than four times as great as of any part of the *Intest. Musculare*; and eight or ten times as great as of the small parts. And doth therefore contain far more than all that *Gut*.

To the undermost part of this *Gut*, about an inch and $\frac{1}{2}$ before the *Anus*, is fasten'd the end of a slender *Muscle*; the other extremity, to one of the *Vertebræ* of the *Loins*.

This *Gut* is furnished with several large *Glands*, not standing in *Clusters*, but singly, as in a *Fox* or a *Dog* presently to be describ'd; but not so big.

The upper End of this *Gut* where it joyns to the *Muscular*, for the length of $\frac{1}{2}$ of an inch, is partly *Conick* and partly *Helick*; being, as it were, the beginning of a *Cæcum*.

On each side the *Anus*, a Bag of *fætid* Liquor, as in the former Animals.

To the *Guts* of a *Cat*, I suppose those of a *Leopard*, *Tiger*, and *Lion*, may have some Analogy.

A Bitch.

The *Gullet* of a BITCH (from the top of her Head to the setting on of her Tail about $\frac{3}{4}$ of a yard) near an inch in Diametre. Somewhat thick, redish, and muscular.

The *Stomach* shaped as a *Cats*, saving that it is a little longer. In length, nine inches; in breadth, six; in depth, as much. Somewhat Muscular, as the *Gullet*. Not very visibly Glandulous, except near the lower *Orifice*. Where, for the space of three or four inches, are a great number of small Glands, yet fairly observable round about.

The *Guts* are Four. The First, or *Crassum*, two yards and $\frac{1}{2}$, and near an inch over, where widest.

The Second, or *Tenue*, about a yard and $\frac{1}{2}$ long, and somewhat more than $\frac{1}{2}$ an inch wide.

The Third, or *Cæcum*, where widest, near an inch; and about $\frac{1}{2}$ a foot long; but winding with three flexures, three several ways. Not joyned to the *Tenæ*, but the *Rectum*; and so postur'd, as to make an acute Angle not with the *Rectum*, but the *Tenue*; in other Animals. And the passage between This and the *Rectum* somewhat straight.

The Fourth, or *Rectum*, half a yard; next the *Cæcum*, an inch over; near the *Anus* an inch and $\frac{3}{4}$. All the *Guts* together, near five yards.

This only, of the Animals yet mention'd, hath a *Cæcum*. Yet without a *Colon*.

The *Guts* of this Animal, as well as the *Gullet*, are all of them thick, redish, and Muscular. The like, I suppose, are those of all *Ossivorous Quadrupeds*.

They are furnished with store of *Glands*. In the *Cæcum*, at several distances from $\frac{1}{4}$ th to $\frac{3}{4}$ th of an inch. Very conspicuous to the naked Eye, even after they are blown up and dry'd. In the two foremost, they stand in *Clusters*; and the *Clusters* in all, about 20. Some of them round, as big as a *Silver Penny* or *Two-penny*; and some Oval, the compass of an *Almond*: and some, especially towards the *Cæcum*, two
or

or three inches long, and $\frac{1}{2}$ an inch broad. Every Gland, as big as a *Turnep-Seed*. The *Cæcum* besprinkled with Flat Glands, the breadth of a *Marshmallow-Seed* or little Spangle. And so the *Rectum*, especially towards the *Anus*; but here big.

In the centre of these Flat Glands, the *Orifice*, or if you will the *Anus* of every Gland is very conspicuous: by which the Gland speweth out a certain *Mucus* or *Pituita*; as by compressing the Gut may be easily seen.

So that although the Glands of the Stomach and Guts, especially in Men and *Quadrupeds*, seem to lie behind, or under the inner Membrane: yet the Mouths of them all, do open into the Hollow of the Stomach and Guts. The *Pituita* which is always found very copious in both, not being half of it, the spittle, or bred of the *Aliment*, as is generally conceiv'd; but spewed out of these Glands.

At the *Anus*, are two Bags of stinking Liquor, as in the aforesaid Animals.

A Fox.

The Gullet, Stomach and Guts of a FOX, ($\frac{1}{2}$ a year old, and $\frac{1}{2}$ yard from Head to Tail) are much like to those of a Dog. But with some differences. The Gullet, in proportion, somewhat larger. The Stomach deeper.

The first Gut, or the *Crassum*, far shorter, not above $\frac{1}{2}$ a foot. The second, or the *Tenue*, somewhat wider. The *Cæcum*, much larger; near $\frac{1}{2}$ of a foot long. It lies not strait out, but is wound up almost spirally. Where it joyneth to the other Guts, $\frac{1}{2}$ an inch over; at the other End, near an inch.

The Guts furnished with several Clusters of Glands, as in a Dog, about 14 in number. That next the *Cæcum* four inches long, and above $\frac{1}{2}$ an inch broad. Before every large Cluster is a little Contraction in the Gut. In the *Cæcum* and *Rectum* much larger than in the *Bitch*.

I suppose it is proper to all other Ossivorous Animals, for the *Rectum* to be furnish'd with such Glands.

Just upon the *Anus* lie two Bags of stinking Liquor, as in the Animals above-said.

CHAP. II.

Of the Stomach and Guts of the Mole; which seems to feed on Insects. As also of the Urchan, Squirrel, and Rat; which are chiefly Frugivorous.

A Mole.

THE Gullet of a MOLE, is not fasten'd to the End of the Stomach, as in the foregoing Animals, but to the middle.

The Stomach shaped somewhat like that of a *Polecat*, and is as big; being three inches long, an inch and $\frac{1}{2}$ broad, and as deep: which in comparison with the small bulk of the Animal, is exceeding great: this Animal weighing not much above three Ounces; but an ordinary *Polecat* betwixt 20 and 30.

The Guts, a yard and $\frac{1}{2}$ long; longer than in the Carnivorous kind. About $\frac{1}{4}$ of an inch over every where. Near the *Anus* a little wider. So that they seem, so far, to be but two. Yet taking in their Texture, they may be three.

The *Texture* of the First (about $\frac{1}{4}$ of a yard long). is plain and simple, to the Eye, as in other Guts. Of the Second, extreme Curious; the *Fibers* of the *Muscular Membrane*, making *Undulations* or *Indentures*, continued for the length of $\frac{1}{4}$ of a yard, round about the Gut: very much resembling the *Needle-work*, commonly called *Irish-stich*. But the *Graver*, though in other respects he hath done tolerably well, yet cometh short of the elegancy of this Work.

Both these Guts are furnish'd with five or six small Clusters of Glands; each Cluster as big as a little Spangle.

The *Rectum*, of a plain Texture, as the First. And without any conspicuous Glands. Half a $\frac{1}{4}$ of a yard long, and where widest, $\frac{1}{2}$ inch over.

Here are none of the Bags described in the *Weefle*, &c. Nor any *Cæcum* nor *Colon*.

An Urchan.

The Gullet of an URCHAN enters the Stomach towards the middle, as in a *Mole*. Somewhat small, not $\frac{1}{4}$ of an inch over.

The Stomach not so large as in the *Mole*, yet bigger than in Carnivorous Animals; as than that of a *Weefle*, although the Body of an *Urchan* of the same age be no bigger, as is plain, when the Skins of both are taken off. 'Tis also of a rounder shape.

The Guts, for substance, seem to be but One. But from the difference of shape, may be accounted Four. The First, or *Crassum*, a yard and $\frac{1}{3}$ th long; and near $\frac{1}{2}$ an inch over, where widest. It hath several, about 12 observable Contractions; some of them an inch or two long, some more, and some less: which, as to their length, is peculiar to this Animal.

The Second, or *Gracile*, is about $\frac{1}{3}$ of a yard long; $\frac{1}{4}$ of an inch over, and of an equal size throughout.

The Third, or *Amplissimum*, $\frac{1}{3}$ th of a yard long; and above $\frac{1}{4}$ of an inch over, where widest.

The *Rectum*, about as long; and above $\frac{1}{2}$ an inch over. So the length of all the Guts, is Two yards and an inch or two: much longer, than in the Carnivorous kind.

The Third and Last, are sprinkled with an innumerable company of extream small Glands, scarce discernible without a Glass; through which, they shew as big as little *Pins* heads.

This Animal hath none of those Bags near the *Anus*, above described in the *Weefle*, &c. Hath no *Cæcum*. No *Colon*.

A Squirell.

That I open'd, was a *Virginian*, smaller than the *European*. The Gullet enters the Stomach towards the middle, as in a *Mole* and *Urchan* very small, like the top of an *Oaten-straw*: so that the upper *Orifice* of the Stomach, hardly lets any thing, so much as wind, to pass into it.

The Stomach two inches long; the left end, an inch over; the right, $\frac{1}{2}$ an inch. The

The Guts may be reckon'd Four. The First, which reacheth to the *Cæcum*, above $\frac{1}{2}$ a yard long; and near $\frac{1}{4}$ of an inch over.

The *Cæcum* very large, near three inches long, and about $\frac{1}{2}$ an inch over. Lies spirally wound up on it self.

The Third, about three inches long, not above $\frac{1}{2}$ th of an inch over.

The Last, about as long. Hath two Contractions and Dilatations; where widest, $\frac{1}{2}$ of an inch over. All the Guts together without the *Cæcum*, not $\frac{1}{2}$ of a yard: the shortest of all yet describ'd.

Here are none of those Bags upon the *Anus*, above mention'd.

A Rat.

The Gullet of a RAT, is extream small, like that of a *Squirrel*; and inserted into the Stomach in the same manner.

The Stomach, with respect to that of a *Mole*, very small; *sc.* three times less: although the Body of a *Rat*, is above twice as big as the Body of a *Mole*.

The substance hereof is also more plainly distinguish'd into two forts. One half, towards the left end, more pellucid, thin and membranous. The other half, *sc.* from the Insertion of the Gullet to the *Pylorus*, more opacous, thick and Muscular.

The Guts may be accounted Five. The First, or *Gracile*, $\frac{1}{2}$ an Elⁿ long, and $\frac{1}{4}$ of an inch over.

The Second, or *Amplum*, $\frac{1}{2}$ a yard long, and $\frac{1}{2}$ ^d of an inch over.

In these two together, are eleven or twelve Clusters of Glands; every Cluster about the breadth of a Spangle.

The Third, or *Cæcum*, contained by a Ligament in an Orbicular posture round about the *Amplum*. Above $\frac{1}{2}$ an inch over, and three inches long. So that take it breadth and length, and it is as big as the Stomach it self.

The Fourth, I crave leave to call the *Abomasideum*: for that it is in figure or structure very like to that *Ventricle* in a *Sheep* or *Cow*, called the *Abomasus*. About two inches long; and near its Conjunction with the *Cæcum*, $\frac{1}{2}$ ^d of an inch over, narrowing all the way to the other end. That

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which

which is curious herein, is, That 'tis furnished with a considerable number of oblique Plates, about 46; 23 or thereabout, on each side oppositely; exactly like to those in the *Abomasus* of a *Sheep*.

The Last, or *Stercoraceum*, is six inches long; $\frac{1}{2}$ of an inch over, where widest. And hath one or two Contractions, as in a *Squirrel*.

The Gullet, Stomach and Guts of a *MOUSE*, are little different. Only the Glands of the Guts fewer; and the *Cæcum*, less.

On the contrary, in a *SHREW-MOUSE*, the *Cæcum* is rather greater, being $\frac{1}{4}$ of an inch over, and two inches long. Yet the Body of the Animal five or six times less than that of a *Rat*.

CHAP. III.

Of the Stomach and Guts of such Animals as are both Frugivorous and Graminivorous; as the Rabbit, Horse, and Pig.

A Rabbit.

THE Gullet of a *RABBIT* is inserted into the middle of the Stomach, as in a *Rat*.

The Stomach shaped almost like a *Dogs*, but bigger, with respect to the Animal. Its inner Membrane is gather'd up into several little Plates, like those in a *Man*. At the End next the *Pylorus*, much thicker, and more Glandulous, Nervous, and Muscular than in any other part.

The Guts, without the *Cæcum*, are four yards long. In number, five. The First, or *Jejunum*, about four feet long, and $\frac{1}{2}$ an inch over.

The Second, or *Ileum*, as long; and above $\frac{1}{2}$ an inch over. Whereas in some, as the *Polecat*, *Dog*, *Urchan*, the Second Gut is smaller than the First.

The *Jejunum* is besprinkled with a great number of very small Glands: which when the Guts are blown up and dry, look like a multitude of little Specks. Whence the Gut is more opacous than the *Ileum*.

Besides

Besides these smaller Glands, the *Jejunum* and *Ileum* together, are furnished with four or five Clusters, about as broad as a *Two-penys*; and every Gland as big as *Wallflower-Seeds*.

Where the *Ileum* enters the *Colon*, it hath a very thick white and Glandulous Body, or *Pancreas Intestinale*: and the mouth of each Gland very apparent.

The *Cæcum*, of a prodigious size; above $\frac{1}{2}$ a yard long, and an inch and $\frac{1}{2}$ over where widest.

At the End of the *Cæcum* hangs a certain Label, also continuously hollow with the *Cæcum*, and may be accounted part of it. Betwixt three and four inches long; and at the upper end, $\frac{1}{4}$ of an inch over; in shape like a Man's Finger. Lined quite through with a thick Glandulous Body, like that in the end of the *Ileum*.

All the rest of the *Cæcum* very thin, and transparent: so as being blown up, it looks like those Skins of *Iceing-Glass*, formerly us'd for Transparent *Flower-Works*.

This Gut seemeth at first, to have many *Valvulæ Conniventes*. But by being blown up, is fairly represented one single *Valve* or *Plate*, stretched out perpendicularly from the circuit of the Gut, and most curiously winding, in a spiral Line, from one End to the other.

This Gut runs into the *Colon*, which is above a foot long, where widest or next the *Cæcum*, an inch over; at the other end $\frac{1}{2}$ an inch. It hath a double *Vinculum*, one on each side; by which 'tis gather'd up into a great number of little Cells, contiguous one to another throughout.

In opening this Animal, being just dead, the *Peristaltick* motion of the Guts, was very apparent, especially in this Gut. By means whereof, the several Cells aforesaid, were made reciprocally to move in and out; so as while one moved and was convex inward, another next adjacent, moved and was convex outward; and so on by a kind of undulation, for several inches together.

This Gut is very thick and Glandulous all over, the Glands standing every where close and contiguous: so that the inside of the Gut, looks like the *Seal-Fishes* Skin. The Glands are not flat, as in the Guts above describ'd, but standing up round and high, like an infinite number of *Papillæ*: the Mouths of each visibly open; from whence a *Mucus* may easily be express'd.

So that all Intestinal Glands are either Flat, or Spherical ; both with a Mouth in the centre. Answering to a *Button-Mould* ; the Flat Gland, to a flat Mould ; and the Sphærical Gland to the like Mould. The former may be called *Rotulares* : the latter *Papillares*.

The Last Gut is about four feet long ; as wide as the *Ileum*, and near the *Anus* wider by $\frac{1}{4}$ of an inch.

This Animal hath none of those Bags observed at the *Anus* of the Carnivorous kind.

A Horse.

The Gullet of a HORSE, is large, thick, red, and very Muscular. The properties of the Gullet in all Voracious *Quadrupeds*. Inserted into the Stomach, not at one End, but the middle, as in a *Rabbit*.

The Stomach single. Not much above a foot long, about $\frac{1}{4}$ of a yard deep, and seven inches over. Which in respect to the Animal, and especially to his Guts, is exceeding small, I had not time to observe the inside, but probably, 'tis gather'd up into Plates or Folds as That of a *Rabbit*.

The Guts are six. The First, or small Gut, about 28 yards. Near the Stomach, two inches over ; towards the other end, two inches and $\frac{1}{2}$. Which though it be wider by far, than the same Gut in any other *Quadruped* that I have open'd : yet in respect to the Amplitude of the other Guts in this Animal, it may properly be called the *Small Gut*. It hath six or eight Contractions or short narrow Necks ; and amongst them, a long one, about a foot before its entrance into the *Cæcum*.

It hath very few, and but small Clusters of those larger Glands, observable in the fore-mention'd Animals. But of a smaller kind, the inner Coat is every where full as it can hold, each Gland not so big as a *Cheese-Mite*.

The Second, or *Cæcum*, is square ; having not two, but four Ligaments which contain it in that figure. By means whereof the sides are also gather'd into many Cells, small and great, as the *Colon* it self in this and other Animals.

The Bulk is vast: Near the Cone, or close end, about three inches over. But at the Base, or where it joyns to the *Colon*,

Colon, a $\frac{1}{4}$ of a yard over. And in length, a full yard. So that it is more than twice as big as the Stomach.

The Learned Dr. *Glisson*, in speaking of the Stomachs of *Quadrupeds*, saith, That a *Rabbit* and a *Horse* have a double *Cæcum*. His words are these; *In Equis, Cuniculis, & Porcellis Indicis, Cæcum duplex deprehenditur*. But herein he is mistaken. As to a *Rabbit*, the contrary hath been seen in the Guts presented entire before this Honourable Presence. And who ever will take the pains to examine all the Guts of a *Horse*, will find, That neither hath he, any more than One *Cæcum*, which I have above describ'd.

The Third Gut, is the *Colon*. The unusual shape, and prodigious Amplitude whereof, might give occasion to the Doctor to mistake it for another *Cæcum*. So that although a *Horse* hath but one single *Cæcum*; yet may he not improperly be said to have a Treble *Colon*; *sc.* Two Ample ones, next the *Cæcum*; and a smaller one next the *Rectum*. Unless any please rather to call the two Great ones, the two *BELLIES* of one and the same *Colon*.

The First *Belly* next the *Cæcum*, is no less where widest, than $\frac{1}{4}$ of a yard over; and in length, above a yard and $\frac{1}{2}$.

The Second *Belly*, next the *Rectum*, as wide as the former; and above a yard long. So that each of these Bellies are bigger than the *Cæcum*. That next the *Cæcum* half as big again: And about four times as big as the Stomach.

These two Bellies are joyn'd together by a *Neck*, about four inches over, and $\frac{1}{4}$ of a yard long. Gather'd likewise into Cells, as all the other parts of the *Colon*. But with four Ligaments, as the *Cæcum*. By which also they lie square. And upon a passing view, might be another occasion of the forementioned mistake. So that if any one shall call either of these Bellies, a *Cæcum*; then a *Horse* will not have two only, but three *Cæcums*. But these Bellies have neither of them, the defining property of a *Cæcum*; which is, To be pervious at one end only.

The small *Colon*, or the smaller part of it, runs betwixt the Second *Belly* and the *Rectum*: likewise full of Cells, contain'd together by two opposite Ligaments as in other Animals. 'Tis about three inches over; and six yards long.

The *Rectum*, very thick and Muscular, as in most other large

large *Quadrupeds*; about three inches and $\frac{1}{2}$ over, and not above $\frac{1}{2}$ a yard long. The length of all the Guts (without the *Cæcum*) is about 37 yards. So that the Guts of a Horse, although they come much short of those of the Animals next mention'd: yet in wideness, much exceed them: So as to contain about ten times more than his Stomach.

A Pig.

That which I procur'd was but 16 days old. The Gullet was torn off; so that I could only observe the Insertion of it, which is about the middle of the Stomach, as in a Horse. But that of a *Hog*, I have often seen, and it is very thick, muscular and red.

The Stomach, was five inches long, and three over. Shaped somewhat oddly; in a manner with a double *Ventricle*. The one, and the principal, may be called *Venter magnus*, shaped like that of Carnivorous *Quadrupeds*. Very thick and Muscular; especially in the Neck and at the *Pylorus*.

Against the *Pylorus* stands a round Caruncle, as big as a small *Filbert Kernel*, like a stopple to the *Pylorus*. A part I think peculiar to this Animal.

This *Ventricle* within, hath several Folds, about $\frac{1}{4}$ th of an inch broad, and as deep; and wind to and fro, as in a *Rabbit* or a Man. Scituate only about the right End or half of the Belly: the other End being, though also Muscular, yet very plain.

At the left End of this greater *Ventricle*, another far less, yet distinct one, is appendent. Much after the same manner as the *Reticulum* in a *Sheep* is to the *Panch*. Or as the *Intestinum Cæcum* to the other Guts: for which reason it may be called *Cæcus Ventriculus*. Separated from the greater by a Muscular Ligament, like a half *Valve*. Where it joyns to it, an inch and $\frac{1}{2}$ over, and thence extended two inches in length; ending in a twisted or hooked *Cone*. Not so Muscular, as the greater *Venter*, but thin and Membranous. The inner surface also plain, or without Folds. Yet is it Glandulous, as the other: but the *Mucus* the Glands yield somewhat thinner.

The Guts of this *Pig* (so young) were near fourteen yards

yards in length. Which is more than doubled, perhaps trebled in a well grown *Hog*. They may be reckon'd six or seven. The First, hath several Flexures, next the Stomach, within the length of a $\frac{1}{4}$ of a yard, and may be called *Serpentinum*.

The Second, about five yards and $\frac{1}{2}$ long, and $\frac{1}{2}$ an inch or $\frac{5}{8}$ over. In this (no more than in the first) are scarce any conspicuous Glands; so that it may be called, *Perspicuum*.

The Third, of the length of the Second; and somewhat less in Diametre. The Vessels of This, are more numerous than of the former. And 'tis furnish'd with several large Clusters of Glands, about nine or ten: some of them an inch and $\frac{1}{2}$, two or three inches long; and $\frac{1}{4}$, or $\frac{1}{2}$ an inch over. And may be call'd *Minus Glandosum*.

The Fourth, is a yard and $\frac{1}{4}$ long; where widest, as the Third; but the greatest part of it not above $\frac{3}{8}$ of an inch. This Gut, instead of Clusters, is Lined with a Glandulous Lace, extended from one end to the other. At the beginning $\frac{1}{4}$ of an inch broad; at the end next the *Cæcum*, $\frac{1}{2}$ of an inch. Spread or extended (as was first observed of the Glandulous Clusters) upon that side of the Gut, as is directly opposite to the Insertions of the Vessels. The other part of the Circuit of the Gut, is very thin and perspicuous. This Gut may be called *Magis Glandosum*.

The extremity of this Gut, doth not only joyn to the *Colon*, but is inserted into it, and therein *protuberant*: very like, in shape and bigness to the Nipple of a Womans Breast that gives suck: and is likewise punched in several places at the top and round about with the *Orifices* of so many several Glands.

The Fifth, or *Cæcum*, is four inches long, and an inch and $\frac{1}{4}$ over. Among all the *Quadrupeds* I have open'd, peculiar to This and the *Cæcum* of a *Horse* to have the same structure with the *Colon*.

The Sixth, or *Colon*, is $\frac{3}{4}$ of a yard long. Where it joyns to the *Cæcum* an inch over; from which place it tapers all along to the other end, where it is not above $\frac{1}{2}$ an inch over. Gather'd up into several Cells from end to end, with two opposite Ligaments, as in a *Rabbit*. At the top of it, just under the abovesaid Nipple, is a large round Cluster of Glands with very fair *Orifices*.
Of

Of all the *Quadrupeds* I have open'd, peculiar to this Animal, a *Horse*, and a *Coney* (perhaps also an *Ass* and a *Hare*) to have a true *Colon*: if that of a Man be the standard for the Definition of it.

The Last, or *Stercoraceum*, is also $\frac{3}{4}$ of a yard long. Scarce any where more than $\frac{1}{2}$ an inch over; and towards the *Anus*, not so much. Whereas in most *Quadrupeds*, 'tis there widest.

Here are no Bags, as above described in the Carnivorous Animals.

CHAP. IV.

Of GRAMINIVOROUS QUADRUPEDS; a *Sheep and a Calf.*

A Sheep.

THE *Gullet* of a SHEEP (three years old, and weighing 120 pounds *Haverdupoise*) about an inch and $\frac{1}{2}$ over: which with respect to the *Pancreas* is but small. Composed of several Organical Parts: which because they are here, as well as in some other larger Animals, more conspicuous, I shall somewhat more particularly describe them.

They are all of them, by *Anatomists*, usually, but improperly called *Coats*: for the inermost, are the chief Body of the *Gullet*: So that 'tis the same, as to call the Wood of a hollow Plant, one of its Coats. 'Tis therefore composed of Five Membranes; Three in the middle, lined with a Fourth, and faced with a Fifth.

The Utmost, and the Inmost, are both Cuticular. The Inmost, or *Glandulata*, exceeding white, and very friable: answerable to the outward Rind of the Root of a Plant.

The next to it, is the Nervous. Which here, and in some other Voracious Animals, is so very thick, that it may more properly be called the *CORPUS NERVOSUM*. Composed of *Fibers*, partly running by the length of the *Gullet*, and in part *transversely* to the two Muscular Membranes. Throughout

Throughout the length of it, run many small Nerves, like the finest *Lawn-Thread*.

This *Corpus Nervosum*, is, as I conceive the *TENDON* to the two next or Muscular Membranes.

These Two (they are at least two) are truly Muscular. *Stenon* hath observed them to be spirally continu'd: which of some of them is true, not of all. And Dr. *Willis* saith also truly, That they *Decussate*, the one winding from the right hand downwards, the other from the left. But, to proceed where these two accurate Persons have left; of the admirable Texture of these two Muscles, it is further observable, That of each parcel of *Fibers*, one half is so distributed, as those *Fibers* which belong to the uppermost Muscle on the right hand, are in their progress towards the left, cast into that which lies underneath. And so on the contrary, those which belong to the Upmost on the left hand, are cast, into that which lies underneath on the right: both together making a perfect Plat, somewhat like to that in a *Riding-Whip*. The other half keeps always above, and is continu'd by a compounded line, partly *Spiral*, and partly *Elliptick*; especially towards and at the bottom of the *Gula*.

The Stomachs or Venters in a *Sheep* are Four. The First, or *Panch*, consisteth of as many Membranes as the *Gullet*. The Inmost and the next, *sc.* the Nervous, are raised up, and made all over rough with a multitude of small Nervous and pointed Knots, in some places smaller and round; in others larger and flat: all very like those upon the Tongue.

In the *Panch* also are several *Gibbosities*, caused chiefly by the doublings and thickness of the Muscular Membranes, in those places. So that they are as it were the *Tendons* of the said Membranes.

The Second *Venter*, is by the *Latins* called *Retikulum*. In which are the like Nervous Knots, as in the *Panch*, but smaller. And comprehended within several round Ridges or Plates composed together in the form of a *Net* or *Honey-Coom*.

The Third, is called the *Omasus*: by *Butchers* the *Feck*. Of a wonderful structure: being divided into above 40 Receptacles by so many Sepiments, great and small:

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some $\frac{1}{2}$, $\frac{1}{3}$, or $\frac{1}{4}$ of an inch, others an inch, or two inches broad. All cover'd with the like Knots, as the two former *Venters*; but extream small.

The Fourth *Venter* is called *Abomasus*: by *Butchers*, the *Read*. The only analogous one to that in a Man; the Membranes hereof being all alike. Saving, That the Plates (as here they are rather than Folds) are far deeper; and oppositely and regularly mett in an oblique posture.

The *Guts* are Six or Eight. The length of all, near 32 yards. The First, or *Serpentine*, from its Flexures, about $\frac{1}{2}$ a yard long, and $\frac{1}{4}$ of an inch over.

The Second, or *Jejunum*, about 13 yards and $\frac{1}{2}$, and as wide as the first.

The Third, or *Ileum*, 11 yards long; and an inch over.

The Fourth, or *Cæcum*, above a Foot in length; and where widest, two inches and $\frac{1}{2}$.

The Fifth, is continu'd from the *Cæcum* without either Valve or Contraction intervening. Above a yard long; and an inch and $\frac{1}{2}$ where narrowest.

The Last, may by way of Eminence, be called the *Muscular*: being as thick as the *Gullet* it self. And This may be subdivided into Three. From the Fifth, it grows small to the length of an Eln; where it is $\frac{1}{2}$ an inch over. Of this width it continues two Elms more and $\frac{1}{2}$. After it widens again, to the *Anus* or the length of another Eln and $\frac{1}{2}$; where 'tis near an inch and $\frac{1}{2}$ wide. In the *Jejunum*, the Vessels are less numerous; in the *Ileum*, more; in the *Cæcum*, and the next, most; and in the Muscular, least.

The Glands, not so observable, as in those of a *Calf*, which I shall next describe.

A Calf.

The Number, Shape, and Texture of the *Gullet* and *Venters* of a CALF, are the same, as of a *Sheep*. The *Guts* much different. In length, about 20 yards. In a well grown *Ox*, at least thrice as long. Asking a *Butcher*, at his *Slaughter-House*, How long he thought they might be; he guessed 30 yards. But believing him mistaken, I caused them to be measur'd, and found them full 60 yards, and four over, which may be allowed for their stretching, for that they were measur'd empty. They

They may be reckon'd seven or nine. The First, the *Serpentinum*, as in a *Sheep*. In length $\frac{1}{2}$ a yard, and $\frac{1}{4}$ of an inch wide.

The Second, or *Amplum* (being the widest of all the rest but the *Cæcum*) is five yards and $\frac{1}{2}$ long; and an inch and $\frac{1}{4}$ broad. These two are very thin, and have scarce any conspicuous Glands.

The Third, or *Magis Glandosum*, near seven yards long, and an inch wide. Furnished with a great many Clusters of Glands, like those in a *Pig*, about 50 of them; an inch $\frac{1}{4}$, or $\frac{1}{2}$ long, and some longer.

The Fourth, or *Gracillimum*, about two yards long; and not above $\frac{1}{2}$ an inch over. Whereas in a *Sheep*, the *Guts* next the *Venters*, and that following, are near of one width. Somewhat thicker and more fleshy than any of the former. Hath several Clusters of large Glands; but nothing near so many, no not with respect to its length, as the precedent: and may therefore be also called *Minus Glandosum*.

The Fifth, or *Maximè Glandosum*, is a yard and $\frac{1}{2}$ long, and an inch wide. By far the most opacous, thick and ponderous of all the five. Lined throughout the length, with such a Glandulous Lace, as in a *Pig*. This Lace is thicker than all the other Parts of the Gut together. At the beginning $\frac{1}{2}$ an inch, at the lower end an inch broad. The rest of the Gut, over which this is not spread, is perspicuous.

The Sixth, or *Cæcum*, near two feet long, and above two inches and $\frac{1}{4}$ over where widest; where narrowest, an inch. Very thin, and without any considerable Glands.

The Last, or *Muscularè*, two yards and $\frac{1}{2}$ long, and of the same Diametre in its several parts as in a *Sheep*; being wide at both ends, and slender in the middle: and may therefore, as that, be subdivided into three.

CHAP. V.

*Of the Uses of the Gullet and Stomachs of Quadrupeds.**And first of the Gullet.*

IN speaking hereof, I shall, as in the Anatomical Part, insist chiefly on those Particulars which have been omitted by others.

It may therefore first be noted of the bore of the *Gullet*, That it is not every where alike answerable to the Body or Stomach. As in a *Fox*, which both feeds on Bones, and swallows whole, or with little chewing; and next in a *Dog*, and other Ossivorous *Quadrupeds*, 'tis very large; *sc.* to prevent a contusion therein. Next in a *Horse*; which though he feeds on *Grass*, yet swallows much at once, and so requires a more open passage. But in a *Sheep*, *Rabbit*, or *Ox*, which bite short, and swallow less at once, 'tis smaller. But in a *Squirrel*, still lesser, both because he eats fine, and to keep him from disgorging his meat upon his descending leaps. And so in *Rats* and *Mice*, which often run along Walls with their Heads downward.

The Thickness of the *Gullet* is also different. So in a *Weeple* or *Pole-Cat*, which eat no Bones, more Membranous or Skiny. In *Dogs* more Muscular, greater force being required to carry down Bones, than Flesh. But in *Sheep*, *Hogs*, *Cows*, *Horses* most of all; for three Reasons: First, For that *Grass*, and especially *Hay* is less slippery, and apt to clog by the way. Secondly, Because they eat continually, and so the *Gullet* is in continual action, which it could not bear without pain, were it not made sturdy for hard labour: in like manner, as are the Muscles of the Chaps, and especially the *Masseter*, in all the said Animals. Thirdly, For that all they eat and drink (because they hold their Heads down) must be made by a greater force to *ascend* into their Stomachs. Whereas in Carnivorous Animals, and especially a Man, it passeth by descent. And there are few, but may remember, how difficult it was, when they were Boys, to drink with their Heads down at a Spring. And although *Dogs* drink with their Heads down, yet they can
only

only *Lap*, their Gullet not being Muscular enough to *carry up* much at once.

The several Parts of the Gullet, have their distinct Uses. The outer Membrane, is both a Fence, and a Swath to all the rest; especially to the Muscular. For the Nervous underneath, being always capable of, and sometimes subject to inordinate expansions (as Dr. *Willis* doth well conjecture) it would Rack the Muscular Membranes beyond their Tone, were they not bound up within this.

The two Musculars, chiefly subserve the several Motions of the Gullet. Amongst which, Dr. *Willis* reckons Oscitation or Yauning, and Expuition. Of the first, (a) his words are these; *In Oscitatione, Oesophagi ductum ampliari, & quasi a vento quodam inflari & expandi sentimus.* But who knows not, that the *Windpipe*, and not the *Gullet*, is the part concern'd in all kinds of Respiration, whereof *Oscitation* is one. Of the latter, his words are these; (b) *Gulæ Tunica carnosæ, duplex quasi Musculus censerî debet; quorum alter, expuitionis opus perficit.* At that time forgetting, that no man ever spat any thing out of his Stomach; no more than he can be said to vomit or eructate out of his Mouth. The Doctor is one, of whom I have learned much: and therefore I mention these Things, only because they lie in my way: and that we may still remember, *Nullius in Verba.*

The Actions of the *Gullet* are therefore principally these Three, *Deglutition*, *Vomition*, and *Eructation*. By one of the Muscular Membranes, saith the forementioned Doctor, sc. that which descends, *Deglutition* is performed; by the ascendent, *Vomition*. His words (c) are these, *Cum unius Fibrarum ordo descendens, Deglutitioni inserviat; alter ascendens, Vomitionis opus perficit.* But that he was herein mistaken, I conceive, appears from the structure of the said Membranes, neither of which, is ascendent or descendent, more than the other; and from the manner of their Contexture, as is above describ'd. Besides, if it were so, why should there not be *Ascendent* and *Descendent Fibers* or *Muscles*; for the Natural, and the Inverted Motions also of the *Guts*?

I conceive therefore, That *Deglutition* and *Vomition* are made by the Cooperation of both the said Membranes: only in the former, the Motion goes from the Throat downward; in the latter, from the Stomach upward. And so

so in *Eruetation*, only with less force. For the performance of which Actions, Two Muscles or Muscular Membranes are yet requisite; and those platted and interchanged, as hath been describ'd: That is, by a double Plat of the *Fibers* of both; whereby half the nether Membrane on the one side the *Gullet*, becomes half the upper Membrane on the other side: and so *vice versa*, in spiral rounds throughout. To the end, That the *Gullet* being hereby contracted in one part, and dilated in the next, might at the same time, thrust forward, and let pass, any body therein contain'd: and that the said *Contractions* and *Dilatations* might be more easily and regularly made, and by reciprocal *Undulations*, carry'd on from one end of the *Gullet* to the other. These *Undulations*, in the *Gullet* of a *Horse*, when he drinks, are very plainly seen.

And that this *Undulation* may be made with more speed, it is observable, That the said *Muscular Fibers* are not continu'd by a close, but very oblique or open spiral Line. Whereby, as the spiral Rounds or Circuits, so the *Undulations*, are the fewer; and consequently, not slowly (as in the *Guts*) but much sooner finished.

Hence it is, That a *Cat* hath so difficult a swallow, the meat commonly seeming to stick in her Throat. Not from the smallness of her *Gullet*; but for that in the longer half of it, the *Muscular Fibers* are continu'd in so close a spiral Line, as rather to seem *Annular*. Whereby, the *Undulations* of the *Gullet* are more slowly and difficultly made. So that a more difficult swallow, being one thing necessary to make her not greedy, but patiently to watch for her Prey; Nature hath therefore contriv'd her *Gullet* for that purpose.

The Nervous Membrane, or (as in some *Graminivorous Animals* it may be call'd) *Corpus Nervosum*, hath hitherto been thought to serve only for sense. Dr. *Willis* Conjectures, That it is also the Instrument of some certain motions of expansion in *Oscitation* and *Preternatural Inflation*: which is all he saith.

But to Me, it seemeth, That it Cooperates with the Muscular Membrane to all the Natural Motions of the *Gullet*, in *Deglutition*, *Vomition*, and *Eruetation*. And, to speak properly, That 'tis nothing else but a HOLLOW

TEN-

TENDON; that is, the *Tendon* of the two Muscular Membranes.

It may be Objected, That then it should lie above, not under the Membranes. But in a *Gizzard*, we find the *Tendon* spread within or underneath the Fleshy part of the Muscles, as well as above.

The truth of this will further appear, if we consider the great Thickness of this Membrane, where the most forceable motions of the *Gullet* are required. For it would serve as well for sensation, if it were ten times as thin: the grossness of the sensory, not being necessary to the exquisiteness of the sense; but of the mover, always to the strength of the motion. And therefore, whereas the *Cuticular* or utmost Membrane is much of the same thickness in all Animals; the Nervous is much varied according to the thinness or thickness of the Muscular: that is, where the Muscle is thick, the *Tendon* is proportionable. The notice of which in *Oxen*, &c. sheweth the same use hereof in a man.

The Inmost Skin or Lining of the *Gula*, is to be a protection to the Nervous, as the outer is to the *Muscular*; that so nothing hard, salt, sower, or any way acrimonious, may be injurious to it. To keep it the better within bounds, in all the motions of the *Gullet*. To be the Bed of the Glands. And one seat of Thirst; which oftentimes lies no deeper than the Throat and upper part of the *Gullet*: and is cured by any thing which by moistening the Throat shall give vent to the *Mucus stagnant* therein.

CHAP. VI.

Of the Uses of the Stomachs of Quadrupeds.

AND first, all *Carnivorous Quadrupeds* have the smallest *Ventricles*; flesh going farthest. Those that feed on Fruits and Roots have them of a middle size. Yet the *Mole*, because It feeds unclean, hath a very great one. *Sheep* and *Oxen*, which feed on *Grass*, have the greatest. Yet the *Horse* (and for the same reason the *Coney* and *Hare*) though

Grami-

Graminivorous, yet comparatively have but little ones. For that a *Horse* is made for labour, and both This and the *Hare* for quick and continu'd motion: for which, the most easie Respiration, and so the freest motion of the *Diaphragme* is very requisite; which yet could not be, should the Stomach lie big and cumbersome upon it, as in *Sheep* and *Oxen* it doth. For which cause Nature hath here transfer'd the greater part of the *Alimental Luggage* into the *Cæcum*.

The Neck of the Stomach, near the Gut, is commonly reflected backward, so as to make an acute Angle with the Back of it. To the end, the extrusion of the prepared *Aliment* to the Gut, may be stinted. And that the thinner part, which will more easily wind about, may the better pass away, and leave the rest behind. Sometimes it hath three or four *Flexures*, as in *Sheep* and *Oxen*: for that the Gut being so small with respect to the *Venter*, and with all so very thin; it would, by too sudden or copious an irruption of the *Aliment*, be in danger of being burst. And for the same reasons, the Stomach of a *Pig*, so voracious a Creature, is also furnished with a Stopple.

The distinct uses of the Parts of the Stomach, are many of them the same as of the *Gullet*. I shall not therefore repeat, but proceed to those particulars as remain to be explicated.

And first, 'tis plain, in those thick Stomachs of an *Ox* or a *Sheep*, that the carneous Membranes are true *Muscles*: which conducteth us more easily to believe that of a man also *Muscular*. 'Tis certain, that the *Muscles* of the *Abdomen* in some Animals, as in *Squirrels*, are thinner than those of a mans Stomach.

Now the Nervous and Muscular Parts jointly subserve to all the motions of the Stomach, which I reckon five, *viz.* *Corrugation*, *Astriction*, *Undulation*, *Convulsion*, and *Voluntary Motion*.

Corrugation, is when there is a double motion of Contraction, beginning from both the *Orifices* of the Stomach, and so drawing it up into innumerable small Wrinkles. For the better expression of the *Mucus* out of the *Glands* of the inner Membrane. For a closer comprehension of the *Aliment*, and immission of the said *Mucus* or other fermenting Juyce, into it. And for the gradual expression of the colli-
quated

quated parts thereof into the Gut. In this motion, the utmost *Muscular Fibers* contract the Stomach in length ; and the inermost, in breadth.

Astriction, is a Contraction only about the *Pylorus* ; performed by the inermost *Fibers* alone. For the firmer Retention of the *Aliment*, and its orderly dismissal into the Gut.

Undulation, is when the Contraction is made in several parts of the Stomach successively, beginning at one *Orifice*, or End, and terminating at the opposite. Made also by the Inner *Fibers* ; after the same manner, as the *Undulation* or *Peristaltick Motion* of the *Guts*. The use of it, is either for *Excretion* or *Eruetation*. If it begins from the *Gullet*, it serves, after the finest of the *Aliment* is discharg'd by *Corrugation*, for Excretion of the rest. But if the *Undulation* be Inverted, or begins from the *Pylorus*, it produceth *Eruetation*. Answering to the like Inverted Motion, which sometimes happens in the *Guts*.

Convulsion, is a forcible and suddain Contraction of all the Orders of *Fibers*, outer, middle, and inmost. The use hereof with *Undulation*, is for *Vomition*. For first, there is only an Inverted *Undulation*, that is, I conceive, when there is only a *Naucea* or tendency to Vomit. Which *Undulation* also, carries part of the matter by degrees, to the upper mouth of the Stomach. And growing quicker and stronger, at last turns into a *Convulsion* ; the Stomach being hereby contracted both in width and length, and the *Pylorus* forced up to the upper *Orifice* (as a *Barbars Puff* in powdering the *Hair*, or the *Bladder* in the Injection of a *Clyster*) and so produceth actual *Vomition*.

The *Voluntary Motion* of the *Stomach*, is that only which accompanies *Rumination*. That it is truly voluntary, is clear, from the Command that Ruminating Animals have of that Action. For this purpose it is, that the *Muscles* of their *Venters* are so thick and strong ; and have several *Duplicatures* as the Bases of those *Muscles*, whereupon the stress of their motion lies. By means whereof, they are able with ease to rowl and tumble any part of the meat from one Cell of the same *Venter* to another, or from one *Venter* to another, or from thence into the *Gullet*, whensoever they are minded to do it. So that the Ejection of the meat

in Rumination, is a *Voluntary Eructation*. Not at all laborious to them, because of the great strength of the Muscles of their Stomach and Gullet to command and govern the same.

By the Joynt assistance of the Glandulous and the Nervous Membranes, the business of *Chylification* seems to be perform'd. The *Mucous* Excrement of the Blood being supply'd by the former, as an Animal *Corrosive*, preparing; and the Excrement of the Nerves by the latter, as an Animal Ferment, perfecting the Work. And the *Cæcus Ventriculus* of a *Hog*, seems to be a *Repository* provided for such a mixed *Leven* or *Menstruum*: whereby he not only becomes more voracious, having thence continual irritations to eat: but all he eats, is thereby likewise well digested.

The Folds of the Stomach, which in its *Corrugation* must needs be much deeper than when it is dilated, or of use, To divide the *Aliment* into several Portions, and thereby administer their Ferments not only to the Circumference, but intimate parts of the Mass to be fermented.

The pointed Knots, like little *Papillæ*, in the Stomachs of divers Ruminating Beasts, are also of great use, *viz.* For the Tasting of the Meat. Dr. *Willis* describing the Inner Membrane of the Stomach (not of a Beast, but expressly of a Man) speaketh thus; *Hæc Crusta Ventriculi* (Humanum puta) *intus obtegens, similis videtur Illi, quæ Linguam obtegit.* Wherein he was mistaken: this Inner Membrane being Glandulous; the Skin of the Tongue not so, but only Fibrous. But of divers Beasts which Ruminates, thus much is true, That in their Three first Venters, the Inner Membrane is Fibrous, and not Glandulous; the fourth only being Glandulous, as in a man. Of the Fibers of this Membrane and the Nervous, are composed those pointed Knots before described (a) both in substance and shape, altogether like to those upon the Tongue. Whence I doubt not, but that the said Three *Ventricles*, as they have a power of *Voluntary Motion*: so likewise, that they are the *Seat* of *Tast*, and as truly the *Organs* of that sense, as is the Tongue it self.

Lastly, and consequently, the said Nervous Knots, are of use to Methodize the Work of *Rumination*, after this manner. The Animal having eaten enough for the *Panch* well

well to govern; rowles and tumbles the meat to and fro therein: and at the same time, with the help of the said Nervous Knots of several degrees of fineness (as the *Goldsmith* hath his *Affayers* of several degrees of niceness) judges of the Courfeness or Fineness, Crudeness, or Concoction of any part of it; and accordingly lets it rest, or removes it. So then the grossest of these *Affayers* standing about the *Gullet*, and so in the passage of the meat between the *Panch* and the *Reticulum*, being the proper judges of what is Course or Crude; if they find it so, then 'tis tumbled back to receive a further maturation in the *Panch*. If somewhat fine and Concocted, 'tis then permitted to pass on and rowl into the *Reticulum*. And the said *Affayers* or *Nervous Knobs* being here sharper and softer, than in the *Panch*; have still a more accurate Taste: and therefore what they yet find too course, the *Reticulum* forthwith throws it up into the *Gullet* and Mouth. From whence, being further refined, 'tis remanded to the *Reticulum*; and thence after a while, into the Third Stomach or the *Omasus*. And This again being a more nice *Affayer* than the *Reticulum*; if it feels the meat fine and soft enough, passeth it into the last Stomach or *Abomasus*. But if otherwise, throws it back into the *Reticulum*, and the *Reticulum* into the *Gullet* and Mouth to be labour'd once again, and so remanded.

CHAP. VII.

Of the Uses of the Guts of Quadrupeds.

I Shall here, as before, pass over such particulars as have been spoken of by others; and divers also which being observable in the *Gullet* and Stomachs, as well as here, have been already sufficiently explain'd.

And first the different Bore of the Guts is observable. So, for example, the Guts of a *Horse* are very wide. For that he both swalloweth, and dischargeth from his Stomach into his Guts, the meat more gross; which therefore requireth a more open passage, lest it should clog. As also, that it may move with greater speed towards the *Cæcum*,

(a) Chap. 6. here, (a) for the reason above-said, design'd by Nature to be a second Stomach. Whereas in an *Ox* or a *Sheep*, the meat having passed four successive Concoctions, 'tis thence delivered to the Guts of a much finer substance; and so moveth safe enough throuh a much smaller Chanel; and fast enough, there being much less work here left, for the *Cæcum* to perform.

The Contraction also of the Guts, or lessening of the Bore by several Necks, is of good use. As for instance, in an *Urchin* or *Cat*; serving to stint the Transition of the meat, that it be not over quick, and dividing the Guts into so many little *Venters*, in which the meat restagnates for some time, in order to its reception of as many repeated Concoctions. Whereby also in these Animals the work of the *Cæcum*, and therefore the making of it, seems superseded.

Moreover, the various length of the Guts is observable, according to the cleanness, or more fewer nutritive parts of the Food; or its colliquability into *Chyle*. So in a *Weefle* or *Squirrel*, that feeds much on Eggs, and Nuts, and such like fine and nutritive food, they are extream short. And in all Gross eaters, longer than in other *Quadrupeds*. And therefore one reason, why the Guts of a *Sheep* or *Ox* are slender, is, that they may be long. For were they shorter and wider, it would not be *tantamount*: For the food being *Grass*, it is not sufficient that they should hold enough: but also necessary, that they give a longer voyage to a substance so jejune, for a thorow solution and exuction of all its nutritive parts. Besides, that in a smaller Channel, the said parts will all along lie nearer to the Lacteal Veins, and so more easily be express'd into them.

The Membranes of the Guts, have a general analogy in all *Quadrupeds*, and divers of their Uses have been well assign'd. I shall therefore only Note, That as the spiral *Fibers* contract or purse up the Bore of the Gut; so those that run by the length, draw it up shorter, and so dilate it. Whereby, as one part of the Gut may press the meat forward, or as it were disgorge it, so another gape to receive it, at the same time. And in case one Gut should by another, or by some Bowel, be oppress'd, being by the said Contraction in length removed a little out of its place; the freedom of its motion, or any thing therein, will thereby be regain'd.

But

But in a *Mole*, the same *Fibers* which run by the length, being Indented, do also for a little way, each parcel obliquely run by the breadth of the Gut. Whereby they are able, without the help of spiral *Fibers*, to narrow or shorten the Gut of themselves: and also to do both in the same place. For by the Relaxation of the *Fibers*, the sides of every Indenture, must needs grow both wider and more distant, and the Gut wider and more extended, at the same time: and so *Vice versa*. Probably with this design, That the Shells of *Insects* may make a more safe transition, without raking against the tender sides of the Guts.

The Glands of the Guts are likewise of great Use. The *Mucus* which they spew, serves to make the Guts slippery, that the meat may the more easily and safely glide along. As also for another Ferment superinduc'd to that of the Stomach, and so a further colliquation of the meat. With respect to both which Uses, the said Glands, according to the Bore of the Guts, the hardness or softness, courseness or colliquability of the meat, are more or less numerous; as in the precedent Examples.

And that this *Mucus* may be duly supply'd, Nature still allows *Blood-Vessels* proportionable to the plenty of Glands. And hath taken care that the Vessels enter not the Guts on the same side on which the Glands are seated, but the opposite: that having space enough to branch themselves into the smallest capillary Tubes, before they reach the Glands, there may be the less danger, that any sincere Blood should with the *Mucus* make an Inundation into them.

Through the same Glands, as so many little Springs, I conceive, That the Humours are either emunged, or precipitated, out of the Blood, in Purgation. For that one so small a *Pipe*, as that of the *Pancreas* should bring so great a quantity, is not at all probable. And the Glands being a visible way, I know no reason, wherefore we should have recourse to any invisible one.

Thus the same Glands are a great means to prevent *Fever*s, and other ill effects of *Cold* by a *Diarrhea*. For when by a suddain astringtion of the Pores of the Skin, or otherwise, the usual perspiration is stop'd: the redundant matter in the Blood, is often safely discharged, by the Glands, into the Guts. But if the matter be very sharp, or rusheth upon
the

the Glands too suddainly ; it sometimes corrodes or breaks them, and so makes way for Blood also : as may be observ'd in the Guts of such as die of a *Dysentry*.

The Use of the *Cæcum* is manifold, but divers in divers Animals ; according to the make of it, and the Relation it bears to the Stomachs and the Guts. And first, for the most part, it serves to give a second Deliberate Concoction to the meat, that nothing nutritive in it may be lost. For which purpose, it is always furnish'd with Glands, as well as the other Guts. And, with respect to its width, is commonly but thin, or less muscular, that so being less apt to constrict itself, it may give a due time of stay to the meat deliver'd to it. For which end also it is placed out of the common Road of the Guts ; that being thereby less receptive of their *Peristaltick Motion* ; it may lie the more still. For the same intent the *Cæcum* in a *Sheep* hath several *Flexures* answerable to those in the 4th Stomach or *Abomasus*. And in a *Hog*, 'tis drawn up into Cells on both sides, like the *Colon*, to make it so much the more retentive. In the *Coney*, the same is done still more effectually, by the spiral Plate, or Connivent *Valve* winding from end to end. And in the *Horse*, not by two only, but four Rows of Cells on the four sides. In which two last Animals the said Use is so eminent, that the *Cæcum*, considering its bigness withall, is the chief Stomach, and much superior to the *Stomach* so call'd. And it is also observable, That the *Abomasideus* in a *Rat*, hath the same relation to the *Cæcum* ; as in a *Sheep*, the *Abomasus* hath to the other Stomachs. Hence likewise it may be, that some Animals have little or no *Cæcum* : either because the meat is so dissoluble, as not to need a second deliberate Concoction, as in a *Weefle* ; or for that Nature hath made something else to serve without it ; as those several Contractions in the Guts of a *Cat* ; and the *Valvulae Conniventes* in the small Guts of a Man. Where we may observe, That these *Valves* are not every where spiral, as is thought, but do also make some perfect and distinct Rings : whereby they are fitter to retard the motion of the meat in its descent.

Another Use may be, For a Retreat ; Either to the meat, if it should chance to rush too fast into the Gut below it : Or to the Excrements, in case the Animal is diverted from a present ejection of them.

The

The last Use, I shall name, may be this, That in case the meat, or the Excrements in the lower Guts should be at any time so dry and hard, as too slowly, and not without much stress to the Guts, to descend; the *Cæcum* is as a *Clyster-Bag*, always ready with its liquid Content, to be in some part thereinto injected. For which purpose, it usually makes an acute angle with the upper Guts, and opens directly into those below it.

The Make of the Colon, with other Uses, also answers to the greater need of Retention. Either because of the upright posture, as in a Man; or frequent and speedy motions, as in a *Horse* or *Hare*: where, without the Cells of the *Colon*, to retain the Excrements from the *Rectum*, there would be a continual *Conatus egerendi*.

The *Rectum*, or rather *Stercoraceum* of a *Cat*, being peculiarly of so great a bulk; I will conclude with a Conjecture of one Use of it: and that is, To be as a *Counter-poise* to her Head: whereby, from what height soever she falls, she still lights upon her feet.

CHAP. VIII.

Of the Stomachs and Guts of BIRDS.

BEcause that many particulars will here occur, which are intelligible from the former Descriptions, and have already been explain'd; I shall therefore be the shorter. Of about Forty, which I have open'd, I shall describe these Thirteen that follow, *sc.* of a *Casowary*, an *Owl*, a *Cuckow*, a *Dunghil-Cock*, a *Tame Pigeon*, a *Jackdaw*, a *Starling*, a *Yellow-hammer*, a *Bull-finch*, a *Wry-neck*, a *Bunting*, a *Reed-Sparrow*, and a *House-Swallow*: and figure them all, but those of a *Cuckow*. With Notes upon others, as I proceed.

Of a *Casowary*.

The CASOWARY hath no Crop. But a wider Gullet, I suppose, as well as Guts, than in any other Bird. Far greater than those of an *Ostrich*; although the Body be much less. The Gullet, where widest, or near the Throat, about five inches over;

over; next the Stomach, two. Sprinkled with many small Glands, as it is, more or less, in all Birds.

At the bottom of it, the *Echinus*; common to all Birds that I have open'd. But here less conspicuous. The Figure hath not express'd it. It hath always a Lining of much larger Glands than those in the *Gullet* or *Crop*; commonly of an Oval Figure, and each of them with an open mouth spewing out a *Mucus*.

He hath no Gizzard (as hath the *Ostrich*); yet a thick Muscular Stomach, as in other Carnivorous Birds. Almost of an Oval shape; and small with respect to the Guts: expressed somewhat too big for the Scale, (as also the *Gullet* and *Guts*) in the Figure. The *Pylorus* guarded with a kind of *Valve*.

The *Guts* not two yards and half long. Beside the two *Cæca*, are three. The larger, next the Stomach: as it is, in almost all other Birds. About three inches and $\frac{1}{2}$ over, where widest. The smaller, somewhat above two. The *Rectum*, the largest, *sc.* about four. Much wider than even those of a *Horse*, excepting only his *Cæcum* and his *Colon*.

He hath two *Cæca*; as have almost all Birds. Yet here very small, about $\frac{1}{2}$ a foot long, but no thicker than a Woman's little Finger. Here, as in all other Birds, making obtuse Angles with the *Rectum*. So that what is said of them in Mr. Willughby's *Ornithologia*, --- *Cum Intestino Recto angulos acutos faciunt*: was only a slip of that most accurate Pen.

The *Rectum* is separated from the next above, by a Conjunct *Valve*.

Of an Owle.

The *Gullet* of a young Grey-OWLE, is of an indifferent size. At the bottom of it, the *Echinus*. And somewhat more apparent, than in the *Casowary*, but less than in most frugivorous Birds.

The Stomach, a middle Thing betwixt that of other Carnivorous Birds, and a Gizzard, *sc.* a plain Bag, yet in the middle somewhat Tendinous.

The *Guts* in length two feet and $\frac{1}{2}$. Three, besides the *Cæca*.

Cæca. The first or *Amplum*, a foot long; and above $\frac{1}{4}$ of an inch broad. The *Gracile*, which reacheth to the *Cæca*, a foot and three inches; and above $\frac{1}{4}$ of an inch where narrowest. In this Gut, are 15 or 16 Contractions, like those in a *Cat's*, but made longer.

The *Cæca*, four inches and $\frac{1}{2}$ long. As the *Gizzard* of a middle Nature, so these of a middle size, betwixt those of some Carnivorous, and some *Frugivorous Birds*. At their close or further ends, $\frac{1}{2}$ an inch over. But where they enter the *Rectum*, no thicker than the biggest string of a *Trebel Vial*.

The *Rectum*, three inches long; towards the *Anus*, near an inch wide; almost in the Figure of a little *Pear*. As it is also in most *Wild-Fowl*.

Of a young Cuckow.

Neither hath this Bird any Crop, nor a Gizzard. But to the Gullet it is peculiar, That it hath Ten or Twelve Rows of more conspicuous Glands, which run along from the Throat to the *Echinus*.

The *Echinus*, of a ratable bigness, and more distinct from the Stomach, than in the *Owle*; being divided from it by a *Muscular Neck*. As it is also in most other Birds.

The Stomach, a plain Bag, much like to that of an *Owle*; yet somewhat thicker, and more Tendinous.

The Guts about a foot and $\frac{1}{2}$ long. Three besides the *Cæca*. The first, an inch and $\frac{1}{4}$ long; and near $\frac{1}{4}$ of an inch wide. The second, above a foot, and $\frac{1}{2}$ th wide. The *Cæca*, as wide in the middle, as the first; and above an inch long. The *Rectum*, two inches and $\frac{1}{2}$.

The *Wild-Duck* and *Teal* also, and I suppose all of this kind, and most other Birds, are without a Crop.

Of a Dunghill-Cock.

A DUNGHILL-COCK, hath one Stomach or Ventricle more than the former Birds, *sc.* a Crop: all over besprinkled with small Glands, somewhat more visible than in the Gullet.

The upper part of the *Gullet*, leading to the *Crop*, $\frac{3}{4}$ of an
E inch

inch over. But the lower part, leading from it towards the *Echinus*, very slender, not above $\frac{1}{4}$ wide.

The *Echinus* almost an Oval shape, being divided from the Gizzard by a pretty long and slender Neck. And may therefore be properly call'd the *Second* or *Oval Ventricle*.

The Third, is the *Gizzard*, in the place of the plain Bag or Stomach in the former Birds. 'Tis made of Six *Muscles* and a *Cartilaginous Lining* in the greater Concave; which may be called the *Laboratory*. Those four, which make the greatest part of the *Gizzard*, may be called the *Grinders*. Of extraordinary thickness; whereby the length of the Convex, is cross to the length of the Concave of the *Gizzard*. Yet thinner towards the Edges, so as to make a kind of double *Hyperbola*. In the Centre hereof on both sides meet the *Tendons* of the said *Muscles*, continued or expanded for about $\frac{1}{2}$ an inch in breadth, without any Carneous or Red *Fibers* mixed with them. From whence, they are divided, the one, which is the stronger, spread over, the other, under the *Muscles*; into which they are also branched all the way, so as meeting in the body of the *Muscle* they make a sort of fine Cancellated Work, as may be seen better in the *Gizzard* of a Goose; especially in a thin slice hereof par-boyl'd, and held up against a *Candle*. And in all *Gizzards*, so as to be seen to run cross, as in that of a *Pullet* in *Tab. 29*.

The Fifth *Muscle* is that which standeth between the *Echinus* and the four *Muscles* now describ'd, and may be called the *Deductor*, from the use hereafter mention'd. Very thin with respect to the former; placed at the upper end of the left edge of the *Gizzard*, and spread a little on the side, but not so much as in the Figure. Better represented, *Tab. 29*.

The Sixth, is such another *Muscle*, standing opposite to the former, *sc.* on the right edge of the *Gizzard*, and may be called the *Reductor*, as shall be shew'd why.

The four *Grinders* are strengthened within, not only with a *Tendon*, but a Gristly Lining, thicker than the outer *Tendon*, with a rough surface, and wrinkled into several *Transverse Furrows*, from one end to the other.

The *Guts* are about a yard and $\frac{1}{2}$ long. Three besides the *Cæca*. The first, the smaller; contrary to what it is in most Birds. Not much above $\frac{1}{4}$ of an inch, where widest. About

About two feet and $\frac{1}{2}$ long. Where it joyns with the Greater, stands the end of the *Ductus Intestinalis*, accurately described (a) by Dr. *Walter Needham*.

(a) Lib. de
Foetu For-
mato.

The Greater, where widest $\frac{1}{2}$ an inch. The *Rectum*, somewhat more. The *Cæca* near eight inches long : at the further end, above $\frac{1}{4}$ of an inch over ; but where they open into the *Rectum*, no thicker than the great string of a *Base-Viol*.

'Tis proper to the *Gallinaceous kind*, to have a great *Gizzard*. That of a good big *Turkey*, near eight Ounces *Troy*. Whereas that of a *Japan Peacock* is not above two : yet the Body about half as big as that of the *Turkey*.

Not only all the *Gallinaceous kind* ; but the *Duck*, and, I suppose, all of that kind, have two very long *Cæca*.

Of a Tame Pigeon.

The *Gullet* of a Tame PIGEON, near the Throat, very wide ; almost an inch and $\frac{1}{2}$ over.

The *Crop* is above three inches broad ; above two, long ; and an inch and $\frac{1}{2}$ deep. Not so distinct from the *Gullet*, as in the *Gallinaceous kind* ; this and the *Gullet* running one into another in a direct Line. In the Belly of it, are few visible Glands : but the Neck thence down to the *Echinus*, is curiously Lined with six or seven Glandulous Laces.

The *Crop* of a *Carrier-Pigeon*, is curiously shap'd ; as it were Treble-Belly'd : the two outmost or side-Bellies, opening into that in the middle. The bottom and Neck whereof, are lined with several Glandulous Laces, as that of the *Tame Pigeon*.

The *Crop* of the *Cropper-Dove*, is almost of the same Figure. But the *Gullet* of a wonderful extent ; when blown up lightly, above nine inches in the girth.

The *Echinus* large, and so the Glands therein ; for the sight of which, I have represented it inside outward. Divided, as usually, from the *Gizzard* by a *Muscular Neck*.

The *Gizzard* rounder than of most other Birds. The *Muscles* very thick and high in the middle, and flatter at the edges. The *Deductor* stands at the top of it, and the *Reductor* at the bottom.

The Greater Gut a foot long, and near $\frac{3}{4}$ th of an inch where widest. The slender Gut above $\frac{1}{2}$ a yard long, and not much above $\frac{1}{4}$ th of an inch over where smallest. The *Cæca* not more than $\frac{1}{2}$ of an inch long, nor thicker than a *Knitting-Pin*. Placed about an inch above the *Rectum*. The *Rectum* near $\frac{1}{4}$ of an inch wide, and an inch and $\frac{1}{2}$ long.

Of a Jackdaw.

The Gullet above $\frac{1}{2}$ an inch over at the top; $\frac{1}{4}$ at the bottom; being *Conick* all the way, as in most Birds.

The Gizzard, above $\frac{1}{4}$ of an inch over, an inch and $\frac{1}{2}$ long, and very Tendinous. The Guts a foot and $\frac{1}{2}$ long. The first or Greater, $\frac{1}{4}$ of a foot; and $\frac{1}{4}$ of an inch wide. The smaller, Ten inches long, and somewhat more than $\frac{1}{4}$ of an inch over. The *Rectum*, two inches long, and above $\frac{1}{2}$ an inch over; shaped like the end of a *Plummers soldering Iron*. The *Cæca*, not much above $\frac{1}{2}$ of an inch long, and very small.

All along the slender Gut, and in part of the *Rectum*, the chief *Muscular Fibers* are most curiously *Indented*, as in the *Mole*; especially near the *Cæca*. Not ill resembling the Needle-Work called *Irish-Stitch*.

Transverse to these *Fibers* which make the *Indentures*, and which are continu'd by the length of the Gut, run others of the same colour, round about it; one of them to every *Indenture*, which it divides into two equal parts.

The same *Indented-Work* is seen in most other smaller Birds, as well as here, but not every where after the same manner, nor in the same place. In the *Twite* or *Avicula Anadavadenfis*, it continues also very far, *sc.* four inches above the *Cæca*. In the *Redstart*, above three. And in the *Titlark*, as far. In the *Water-Wagtaile*, not above two and $\frac{1}{2}$; and an inch below them. In the *Solitary-Sparrow*, they are also very pretty below the *Cæca*. In the *House-Sparrow*, they are visible only in the small Gut an inch and $\frac{1}{2}$ above the *Cæca*. In the *Chaffinch*, only in the *Rectum*.

The Gullet of a *Jay*, being contracted in the middle, is divided into two slender *Venters*, as the Guts of some Animals. So also is that of a *Japan Peacock*.

The *Rectum* of a *Jay*, hath several *Muscular Plates*, or
Valvulae

Valvulae Conniventiss placed at the distance of $\frac{1}{2}$ or $\frac{1}{3}$ of an inch.

Of a Starling.

The Gullet exceedeth not $\frac{1}{2}$ an inch in width. The *Echinus* small, with respect to the other parts. The Gizzard, mean; near an oval shape: the *Reductor* conspicuous. Next to the Gizzard stands the slender Gut, and the Greater follows; as in the *Dunghill-Cock*: contrary to the order kept in most other Birds. Where they meet, there is a remarkable Contraction. The Indentures run along the lower half of the Ample Gut; with some *Undulations* over-against the *Cæca*.

Of a Yellowhammer.

The Gullet, at top is dilated into a *Crop* an inch and $\frac{1}{2}$ long, and above $\frac{1}{2}$ an inch over. The *Axis* whereof, as in a *Pigeon*, is the same with that of the lower part of the Gullet, and not *transverse*, as in the *Gallinaceous kind*. Curiously Laced with 16 or 18 Rows of Glands, about half an inch long. The *Green-Finch* hath a *Crop* of the same shape: but the Glands sprinkled all over it; very small, yet distinct.

The *Echinus* very small; not above $\frac{1}{4}$ of an inch long, and as broad.

The Gizzard above $\frac{1}{2}$ an inch long, almost $\frac{3}{4}$ an inch broad; thin edg'd, but high in the middle; very strong and Tendinous. And it may here be observ'd, That although the *Gallinaceous kind* have a very large Gizzard: yet in many other Birds, even of the smallest sort, the Gizzard, with respect to its bulk, is altogether as strong: that is to say, the *Muscles*, with respect to their length and breadth, are as Thick, and their *Tendons* answerable; as not only in this Bird, but the *House-Sparrow*, *Linnet*, *Titlark*, and many more. And with respect to the Body, some small Birds have also a great Gizzard, as a *Chaffinch*, which hath one four times as big as that of a *Linnet*.

The Guts about eight inches long. The Greater, three; and above $\frac{1}{4}$ over where widest. The smaller, about three and $\frac{1}{2}$; and above $\frac{1}{2}$ th wide. The *Rectum* an inch and $\frac{1}{2}$ long, shaped like a *Pear*; $\frac{2}{3}$ ^{ths} over in its widest place: very great. The *Cæca* stand $\frac{1}{4}$ of an inch, below its smaller end: not above $\frac{1}{2}$ th of an inch long. The

The Indentures continu'd about $\frac{3}{4}$ of an inch from the *Cæca* both upward and downward.

The Annular, or rather spiral *Fibers*, in the *Rectum* more apparent.

Of a Bull-Finch.

A very different Bird from all the *Finches*. For first he hath a Lateral *Crop*. 'Tis above $\frac{1}{2}$ an inch broad, and about $\frac{3}{4}$ long. The *Gullet*, between the *Crop* and the *Echinus*, near $\frac{1}{2}$ th over. The *Echinus* near $\frac{1}{2}$ an inch long, and above $\frac{1}{4}$ broad: Thrice as big, as that of a *Martlets*, *Swallows*, or *Sparrows*. The *Gizzard* near $\frac{1}{2}$ an inch broad; broader than long.

The *Guts* no less than $\frac{1}{2}$ a yard and an inch long: much beyond what they are in any of the *Finches*. The Greater, a foot and $\frac{1}{2}$ an inch; and $\frac{1}{4}$ th wide. The smaller five inches and $\frac{1}{2}$; and $\frac{1}{8}$ th in width. The *Cæca*, at the end of the *Rectum*, not above $\frac{1}{12}$ th of an inch long. The *Rectum*, near an inch: and where widest, almost $\frac{1}{2}$ an inch. Figur'd like a *Pear*, as in most other Birds.

The whole smaller *Gut*, and about five inches of the greater, very curiously Indented. And the Indentures deeper in the latter.

A Young Wryneck.

Hath no *Crop*, and but a small *Gullet*; not much above $\frac{1}{4}$ of an inch, where broadest. The *Echinus* of a prodigious bigness; near an inch and $\frac{1}{4}$ long, and $\frac{1}{2}$ an inch over. Much bigger than in a *Jackdaw*, that is yet near six times as big as this Bird. I found it full of meat. The *Gizzard* of a mean size; $\frac{1}{2}$ an inch long, and $\frac{3}{8}$ ths broad. The *Guts* about eight inches. The greater, near two; and near $\frac{1}{4}$ wide. The next, four; and somewhat more than $\frac{1}{2}$ th broad. The *Rectum*, above two and $\frac{1}{2}$; and $\frac{3}{8}$ ths, where widest. The spiral *Fibers* herein more visible. He hath no *Cæca*. The Indentures not so regular, as in most Birds, and but few.

As this Bird hath no *Cæca*; so the *White-Throat*, hath no small Gut.

Of a Bunting.

Hath no *Crop*. The *Gullet* from end to end; above a $\frac{1}{4}$ of an inch over where slenderest. The *Echinus* $\frac{3}{4}$ th long, and as broad. The *Gizzard* large, about $\frac{3}{4}$ of an inch square. The *Guts*, ratably, extream, short, not above nine inches long. The larger, four inches, and $\frac{1}{4}$ wide. The next, as long; and $\frac{1}{2}$ th over. The *Rectum*, about an inch; and not very wide. The *Cæca* not above $\frac{1}{6}$ th. The *Indentures* continu'd from the *Cæca* upward, three inches, but less visibly. Downward or towards the *Anus*, a $\frac{1}{4}$ of an inch, very curious.

Of a Reed-Sparrow.

The *Gullet*, *Echinus*, *Gizzard*, and *Guts* of this Bird, are all much like in shape to those of a *Bunting*: and ratably, less.

Of a House-Swallow.

The *Gullet* above $\frac{1}{4}$ of an inch over next the Throat; next the *Echinus*, $\frac{1}{2}$ th. Laced with eight or nine Rows of Glands by the length, as in a *Pigeon*. He hath no *Crop*. The *Echinus*, above $\frac{1}{4}$ of an inch long, and as wide. The *Gizzard* near $\frac{1}{2}$ an inch long; and $\frac{3}{4}$ th broad. The *Guts* about five inches long. For the bigness, strong and muscular. The *Indentures*, for the length of an inch and $\frac{1}{2}$, very fine; especially, when the *Guts* are blown up. The *Cæca* $\frac{1}{2}$ th of an inch. Between the Indented Gut and the *Rectum*, a great Contraction: but is omitted in the Figure.

In a *Robin-Redbreast*; the *Guts* are more Muscular, than in any small Bird. The *Cæca*, fasten'd, not as usually either on the Neck of the *Rectum*, or where that and the smaller Gut meet; but $\frac{1}{2}$ an inch above the end of the smaller Gut. None of them have any visible *Indentures*.

CHAP. IX.

Of the Uses of these Parts.

THe *Gullets* of Birds, are bigger or less, according to the quantity they swallow. More or less Glandulous, according to the Solidity, or the Dryness of their Meat. And with respect to the same, the Figure thereof is more simple; or expanded into a *Crop*; by which it is retain'd a longer time, before it further descends. And according as less or more Time is requir'd, the *Crop* is made so, as either to have its *Axis*, the same with that of the *Gullet*; or else to stand Collateral, and so open *transversely* into it.

After the Meat hath been sufficiently macerated there, it descends into the *Echinus*, for a second preparation. So much the more thorowly made here, because by far greater Glands. And what was done before to all at once, is here in, to smaller parcels. This Part in some sort answering to the *Crop*, as the *Reticulum*, in a *Sheep*, to the *Panch*. Withall it should seem, That when the *Gizzard* is either over loaded, or the Meat not enough prepar'd; 'tis thence returned back to this Part, (as the *Reticulum* also subserves the *Omasus*) till It and the *Gizzard* are more ready, one for the other. For whichend also the *Muscular Neck* below the *Echinus*, serves as a *Sphincter* to purse it up.

At length it descendeth into the Third *Ventricle*. Either Membranous, as in most *Carnivorous Birds*; where the Meat is concocted as in a Man. Or somewhat Tendinous, as in an *Owle*; as if it were made indifferently for Flesh, or other Meat, as he could meet with either. Or most Thick and Tendinous, called *The Gizzard*; wherein the Meat, as in a Mill, is ground to pieces, and thence pressed by degrees into the Guts in the form of a *Pulp*. For which purpose, the *Deductor* serves to deliver the Meat from the *Echinus* to the *Laboratory*; as a *Hopper* to a *Mill*. The four Grinders or chief Operators, as the *Millstones*: Partly, as they are extraordinary Thick, and made with double Tendons; whereby they are constring'd with the greater force. And partly, as their Tendons stand high in the centre, so as to be *arched*: for so, every time the Tendons are contracted, they must needs

needs make a shallower Arch, and so force the insides of the Grinders closer together. And as the *Millstones* are peck'd and cut with small Gutters, least their force should be evaded: so the Gristly Lining of the Gizzard is all over rough, and gather'd into answerable Furrows. And because the forceable motion of the Grinders, must needs work the Meat from under them: as therefore in some *Mills* there is one attends still to turn the Grist under the Stone; so the *Re-ductor* here, to deliver it back to the Grinders, and so over and over, till it be sufficiently elaborated for the Guts.

And as the strong and continual motion of all these *Muscles*, is taught us from their structure, so likewise from their red colour, which especially in the Grinders is intense. Hence in a *Fish*, the *Muscles* which move the *Fins* are usually Red, although the rest of the Flesh is very white: And so the Leg of a *Domestick Fowl*. Whereas the Wings also of a *Wild Fowl*, are of the same colour. So likewise the Flesh of a driven *Calf*, or of a *Hare*, though that of a *Coney* be white. And that which comes nearer, the Heart in all Creatures, having the like continual motion, is of a Red Colour.

The Guts are of different length and bigness, not always proportionable to that of the Bird, but the nature of the Meat. So those of a *Casowary*, though it be necessary, that they should contain Meat enough for so great a Body: yet not, that the Meat, which is very nutritive, should make any long voyage. Yet is it needful there should be a *Connivent Valve* before the *Rectum*, for the guarding of so open a passage. And so with Variety in other Birds, according as they feed on *Worms*, *Seeds*, *Fruits*, *Flys*, or *Shell'd Insects*, requiring a longer, or more open passage, for their more deliberate, or safer Transmission to the *Anus*.

The *Indentures* also seem to be made, and with variety; to the same Intent: *sc.* That the Guts hereby receiving the greater Contraction and Dilatation, may so much the more forceably detrude the Meat, or more easily give way to it; as it is softer, or mixed with Shells, Stones and the like.

The *Cæca*, especially where large, and made for a further Concoction of the Meat; for the better Retention hereof, where they open into the *Rectum*, are very straight. And for the same reason, also thinner and less *Muscular* than the

other Guts: that so the Meat therein may lie the more quiet.

The ampliation of the *Rectum*, chiefly in *Wild Fowls*, amongst other Reasons, is, I suppose, That the Dung lying there in good quantity, may be as a *Counter-poise* to the Head, to keep it up in flying.

CHAP. X.

Of the Stomachs and Guts of FISHES.

IN so many as I have open'd, two Things are more generally observable, viz. That many of them have no Stomach, that is one that is not Belly'd; as in the *Salmon*, *Jack*, *Tenth*, *Barble*, *Breme*: or very little, as in the *Place*. And many more, instead of One *Cæcum*, as in some *Quadrupeds*; or Two, as in most Birds; have three or four, as the *Pearch*; nine or ten, as the *Rochet*; many more, as the *Trout*, above thirty; the *Whiting*, above forty; the *Salmon* many more.

The Stomach of a *Place* shaped almost like the *Echinus* of a Bird. Bounded at the bottom with a *Connivent Valve*. The Guts two only. The upper end of the first, hath two little extuberant Parts, the use whereof may be answerable to one use of the *Cæcum*, sc. To divert the Meat, lest upon any Inverted Motion of the Gut, it should regurgitate into the Stomach, or strain the *Valve*. The bottom of this Gut is separated from the *Rectum*, by another pretty *Connivent Valve*: both which, and the visible Texture of the *Fibers*, are shewed in the last *Table*.

The Stomach of a *Salmon* is only like a wide Gut. He hath about fourscore *Cæca*, hanging on the great Gut, almost like the *Mane* upon the *Neck* of a *Horse*. Being ty'd altogether with small Vessels, and the Vessels hid with Fat; they have been mistaken by some for a *Pancreas*. The *Rectum* is guarded with about thirty *Annular Valves*.

The *Whiting* hath a large Stomach, which is a distinct Bag or Belly. And numerous *Cæca*, not standing as in the *Salmon*, but all in a Ruck. The Stomach and Guts of a *Cod* are very like.

Some

Some NOTES upon the TABLES.

TAb. 1. Describ'd, p. 9, 14, 19, 27. The Stone only, drawn after the life.

Tab. 2. Desc. p. 11, 13, 21, 24, 25, 29. All but the Ram's Horns, after the life.

Tab. 3. Desc. p. 36, 38.

Tab. 4. Desc. p. 42, 50.

Tab. 5. Desc. p. 63, 64, 67.

Tab. 6. Desc. p. 78, 80. The double Egg drawn after the life.

Tab. 7. Desc. p. 87, 104, 108, 110, 113, & 114.

Tab. 8. D. p. 115, 117, 121, 123.

Tab. 9. D. p. 126, 127, 128.

Tab. 10. D. p. 130, 131.

Tab. 11. D. p. 133, 135, 136, 137, 140.

Tab. 12. D. p. 140, 141, 142, line 9. p. 146, 148. line 1. p. 149.

Tab. 13. D. p. 154. line 13. p. 156, 158, 161, 163, 165, 166.

Tab. 14. D. p. 188. line 13, 23, & 30. p. 189, 190. line 18, 33, & 40, 191.

Tab. 15. D. p. 197, 198.

Tab. 16. D. p. 201, 202, 203, 204, 205, 206.

Tab. 17. D. p. 185, 216, 229.

Tab. 18. D. p. 233, 243, line 22, p. 244. line 37. p. 245, line 33.

Tab. 19. D. p. 254, 255, 256. line 33, 263. line 35. p. 264. line 3, & 19.

Tab. 20. D. p. 267, 268, 273, 276, 291, 297, 302, 303.

Tab. 21. D. p. 305, 306, 307. line 23. p. 308, 312.

Tab. 22. D. p. 315, 323, 326. line 34. p. 329, 330.

The rest belong to the *Anatomical Part*.

Tab. 23. In which the Stomach and Guts of a *Fox*, are supposed to be turned inside outward, to shew the Glands.

Tab. 24. In which all the Guts are supposed to be inverted, to shew their Glands and inward Structure.

Tab. 25. Where some Faults are to be rectify'd by the Descriptions. To which the *Reader* is desired always to have regard.

Tab. 26. In which the Stomach and Guts of a *Sheep* supposed to be Inside outward.

Tab. 27. In which the width of the *Casowary's* Guts is somewhat above the *Scale*.

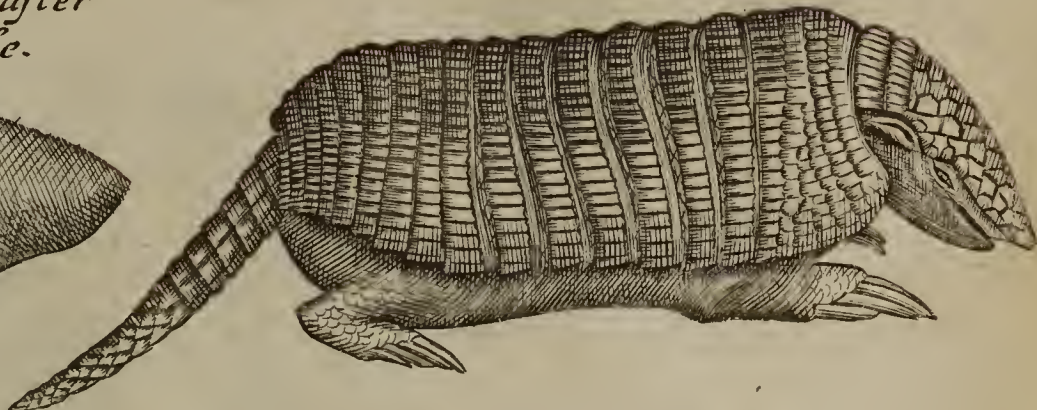
Tab. 28. In which the *Gizzard* of the *Dunghill-Cock* is not so well drawn, as in the following *Table*. The *Pigeons* Crop drawn Inside outward, to shew the Glands both in that, and in the *Echimus*.

F I N I S.

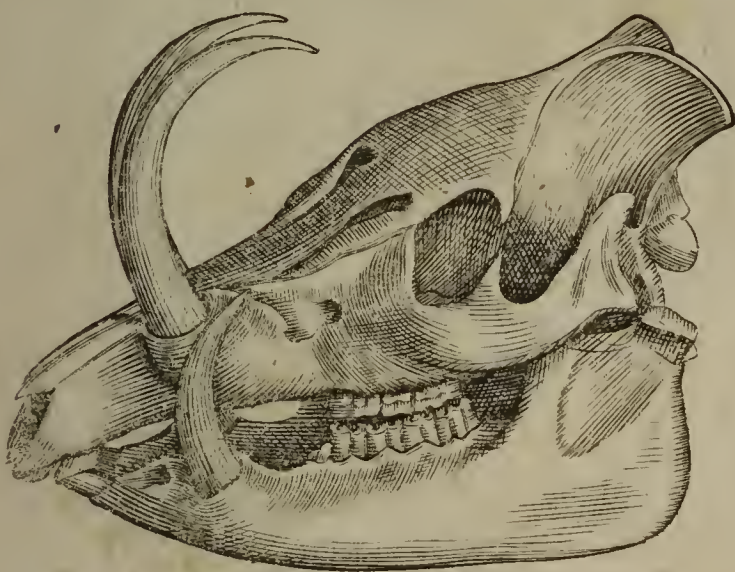
A Stone voyded by y^e
Urethra of a Man: after
y^e life.



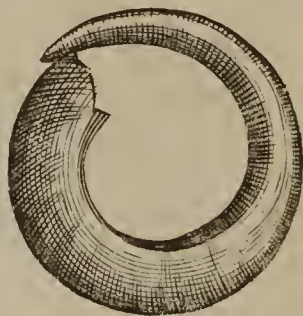
Weefle Headed
Armaddillo.



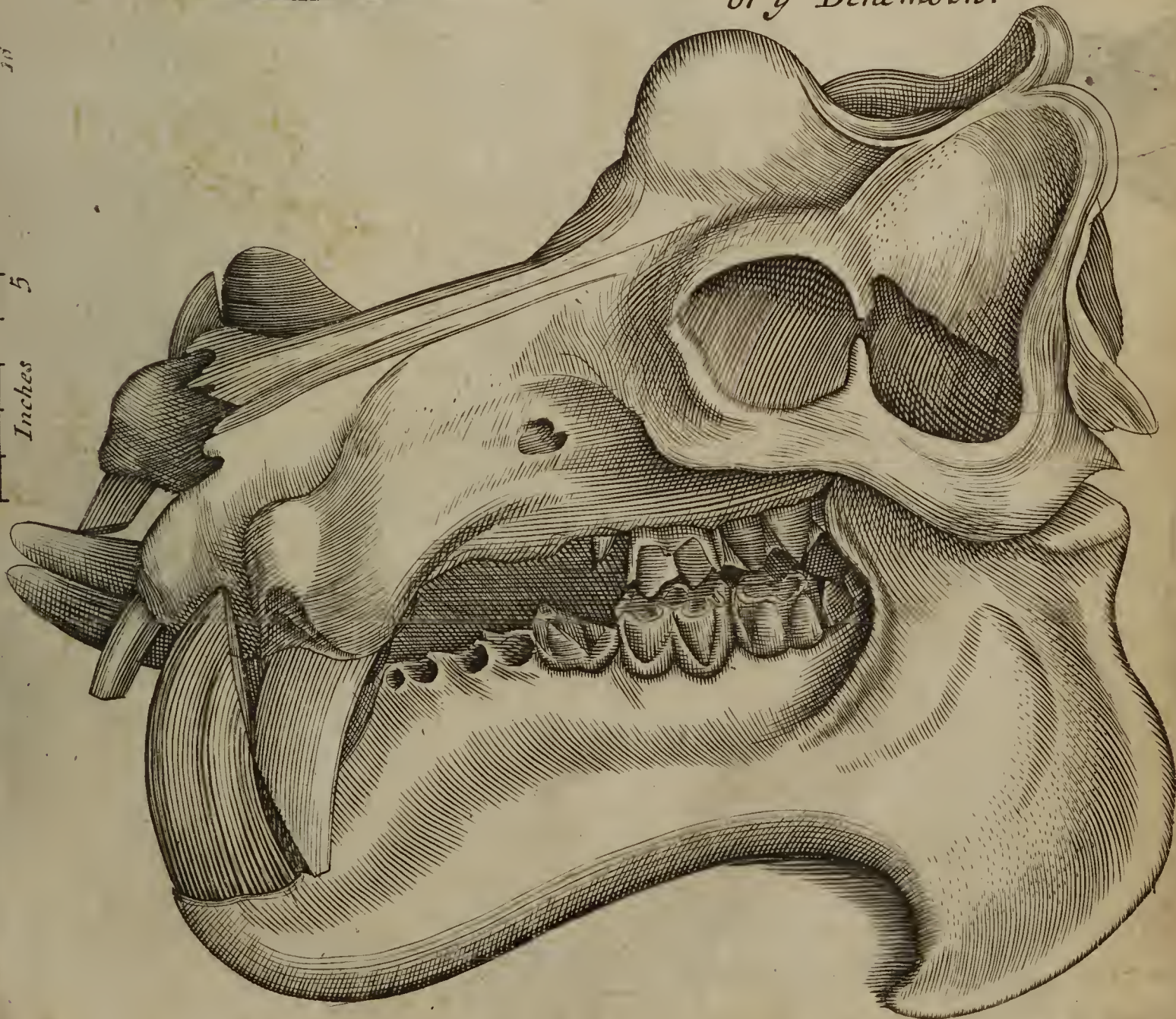
Head of y^e Baby-Roussa.



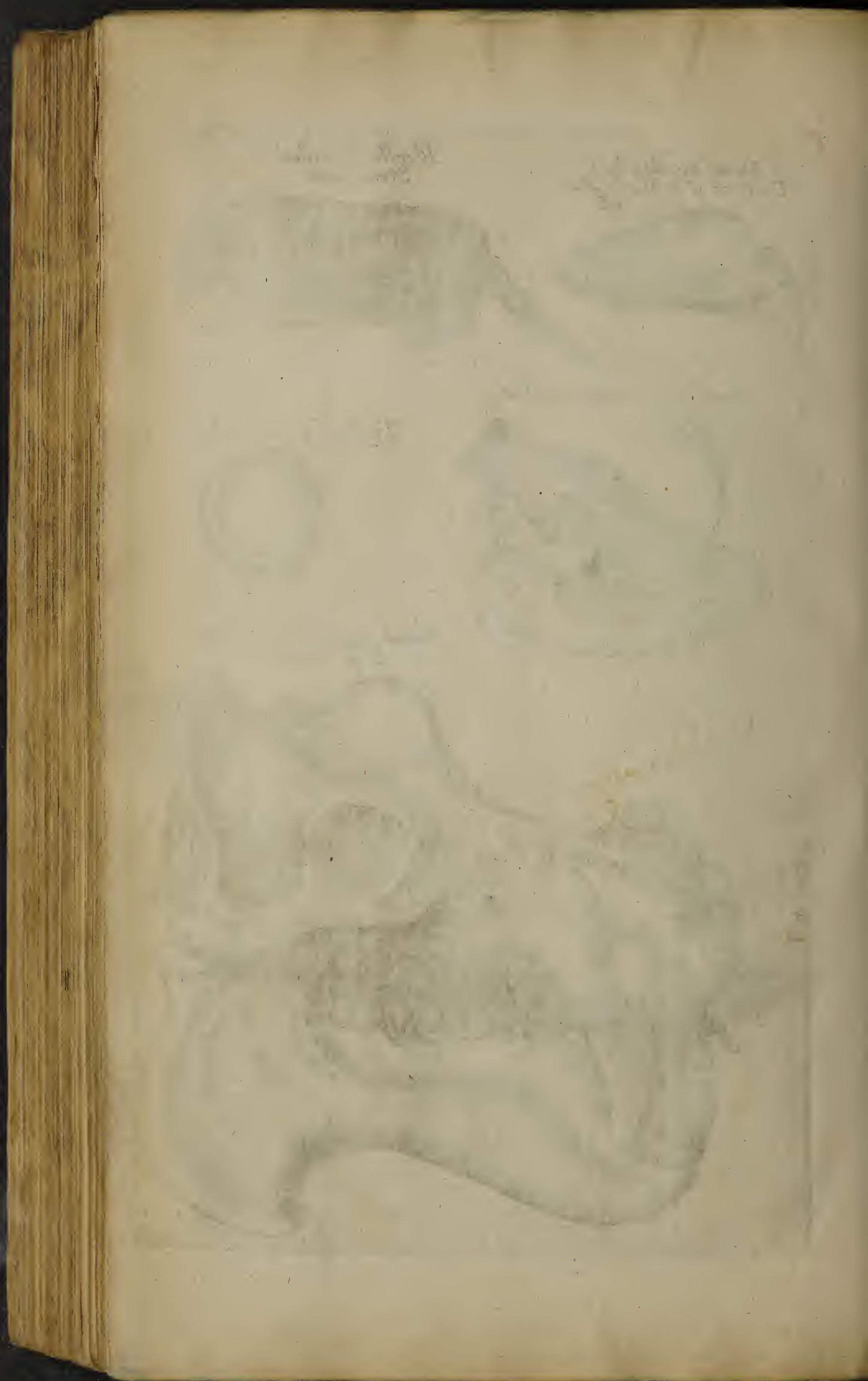
Tusk of a Wild Boar.



Head of y^e Hippopotamus
or y^e Behemoth.



25
20
15
10
5
Inches



1. 1/2 inch diam. 1/2 inch high.



2. 1/2 inch diam. 1/2 inch high.



3. 1/2 inch diam. 1/2 inch high.



4. 1/2 inch diam. 1/2 inch high.



5. 1/2 inch diam. 1/2 inch high.

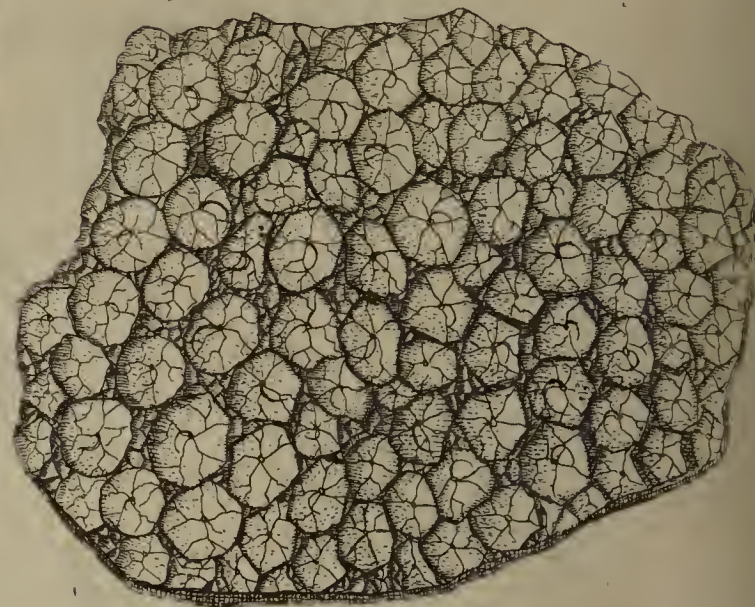


Tab. 2.

*Muscovy Ram's
Horns*



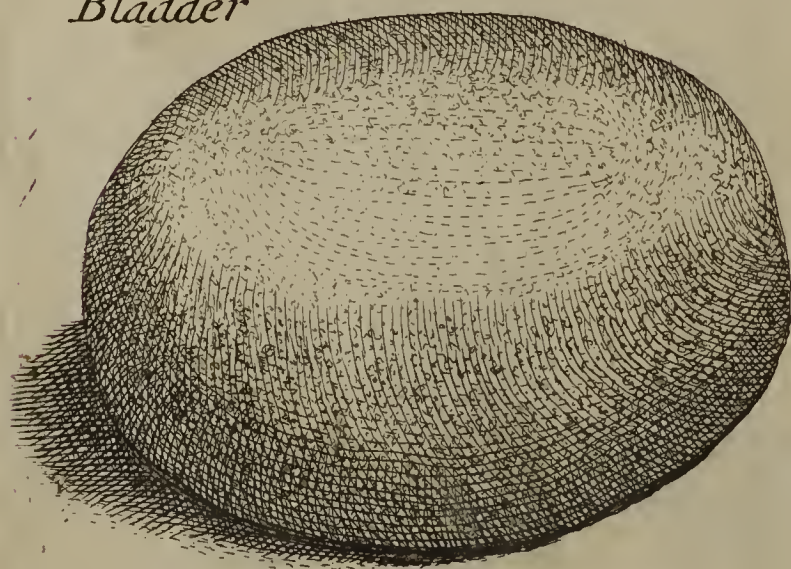
*Skin on y^e Buttock of a
Rhinoceros*



*A Greenland Deer's
Horns*



*A Stone out of a Dogs
Bladder*



*Throttle Bone of a Mon-
key*



Greenland Stag's Leg.

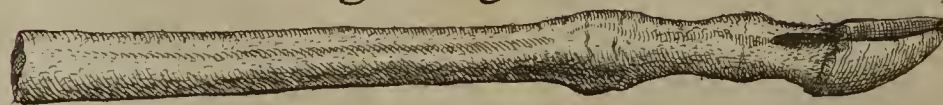


Fig. 1. *Amphipoda*
1870

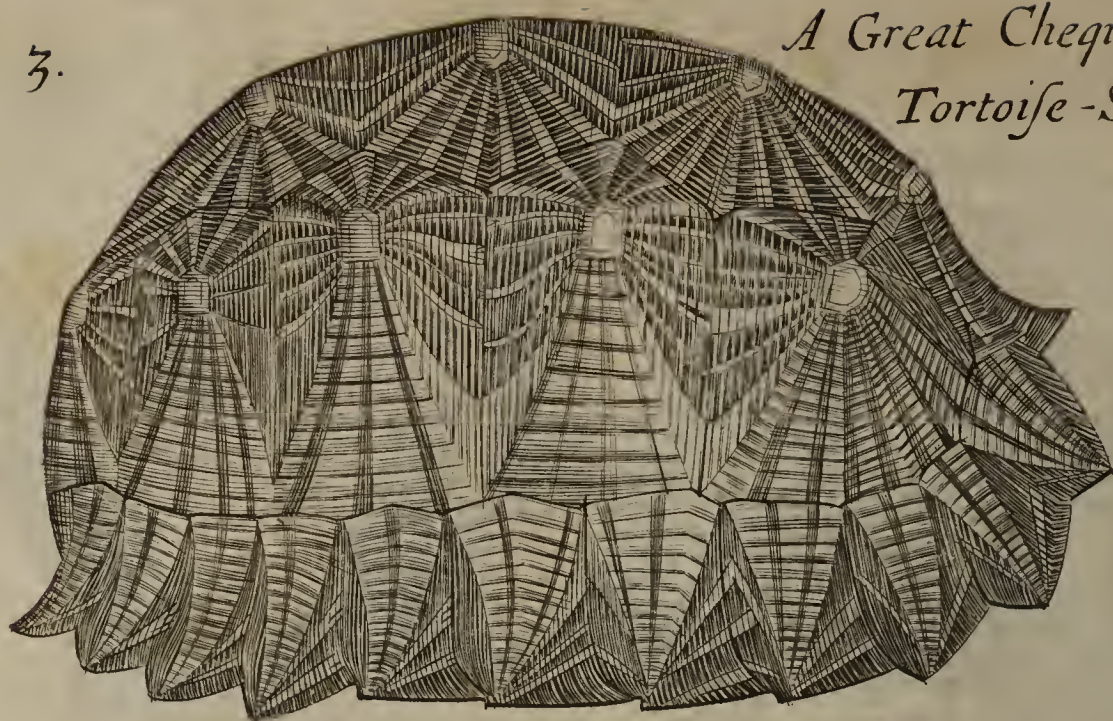


Fig. 2. *Amphipoda*
1870



Tab. 3.

*A Great Chequerd
Tortoise-Shell*



12

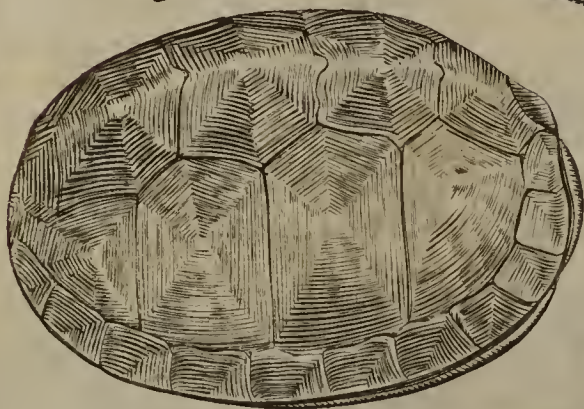
9

6

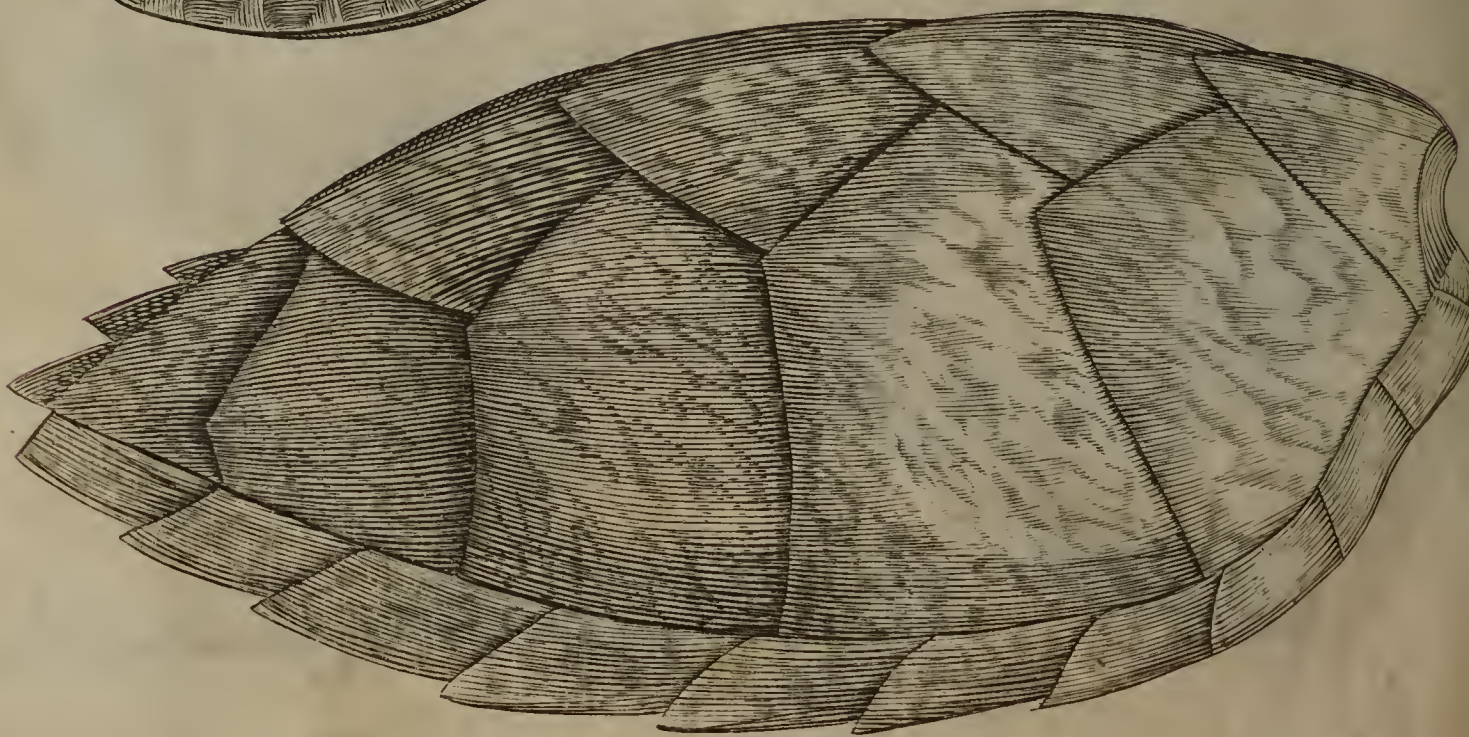
3

Inches

*A Lesser from
Virginia :*



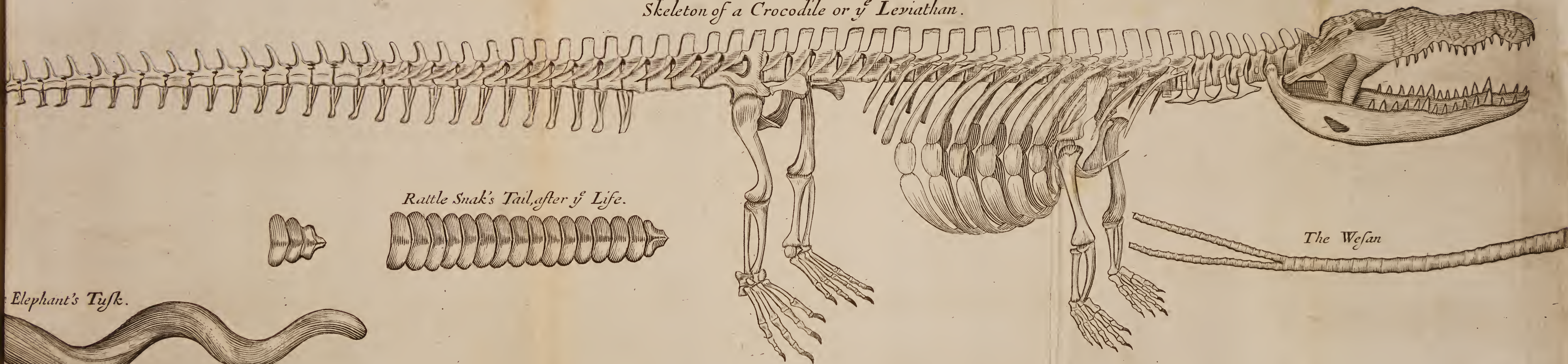
A Scaled Tortoise Shell

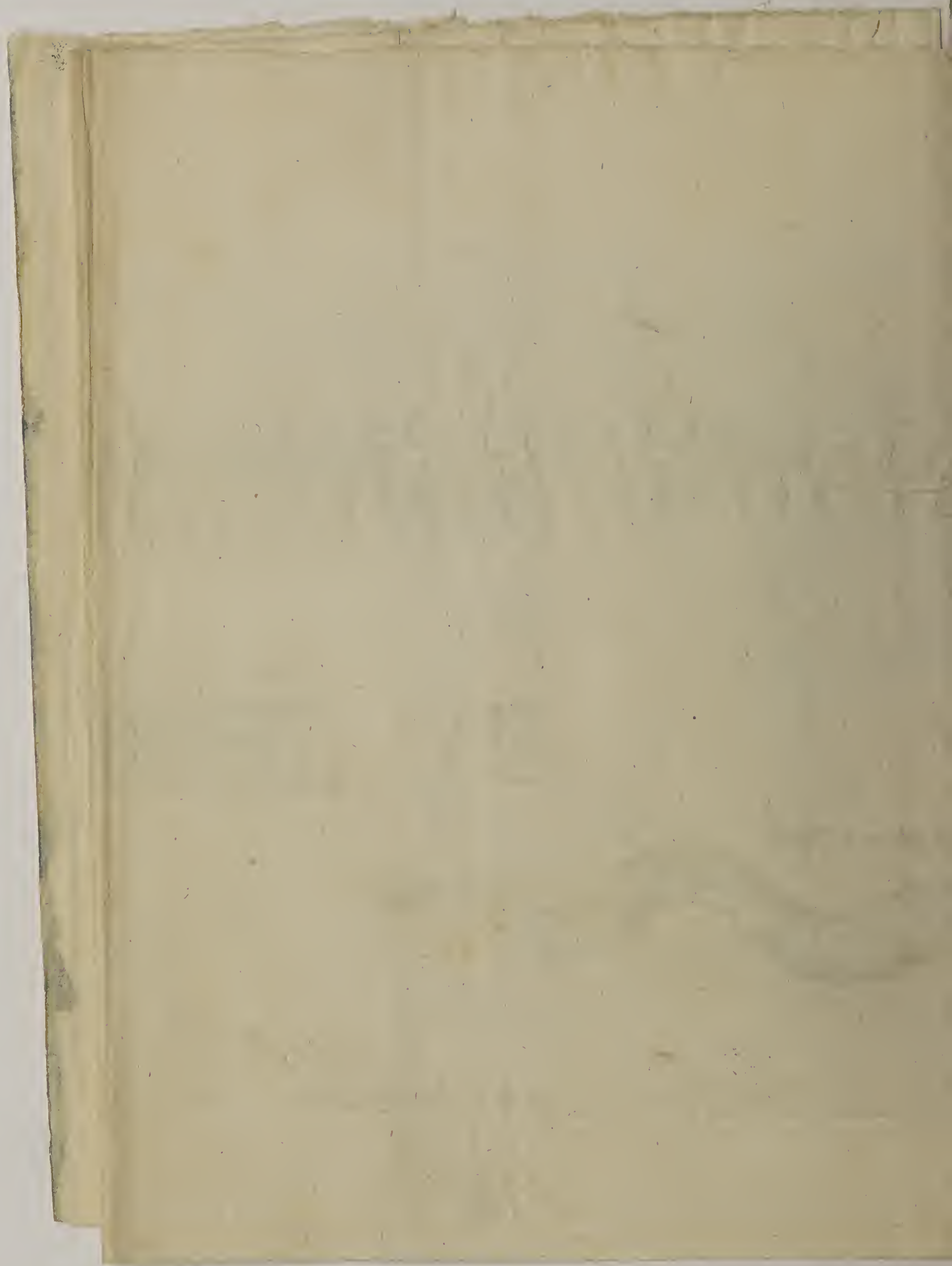


2

Feet. 1 2 3 4 5 6 7

Skeleton of a Crocodile or y^e Leviathan.





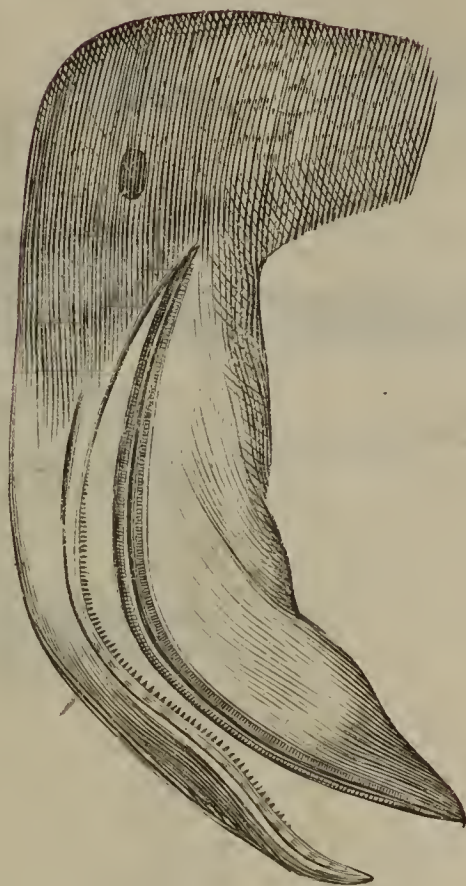
Ind: Stork's Head



Ind: Hern's Head



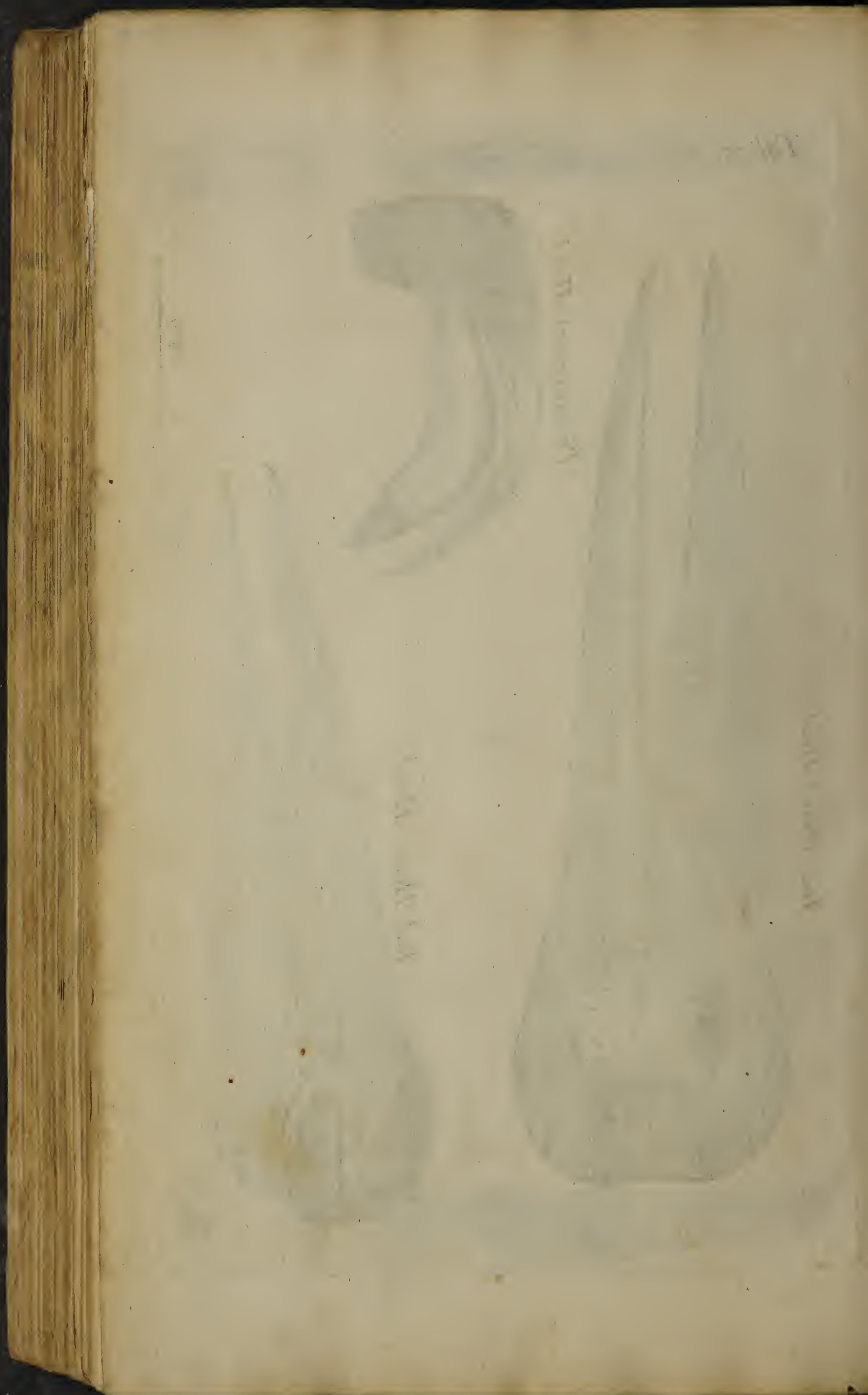
Phoenicopterus Head



Inches

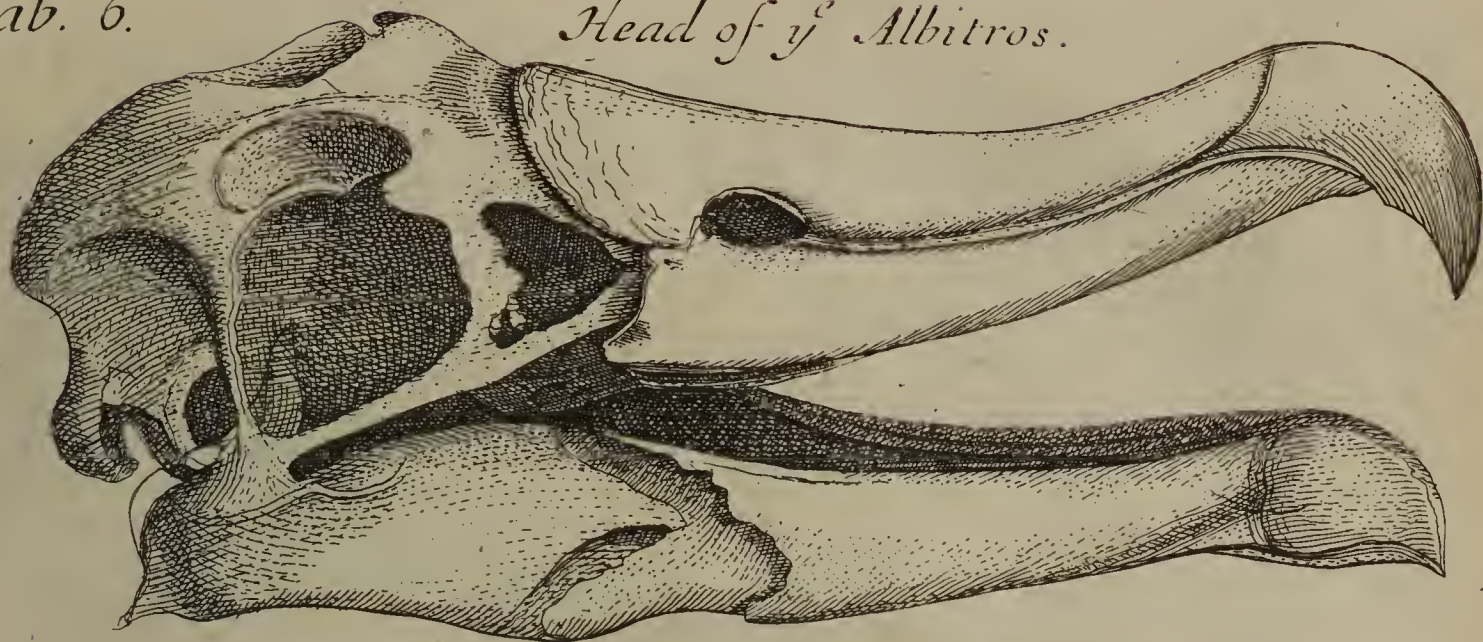
10

5

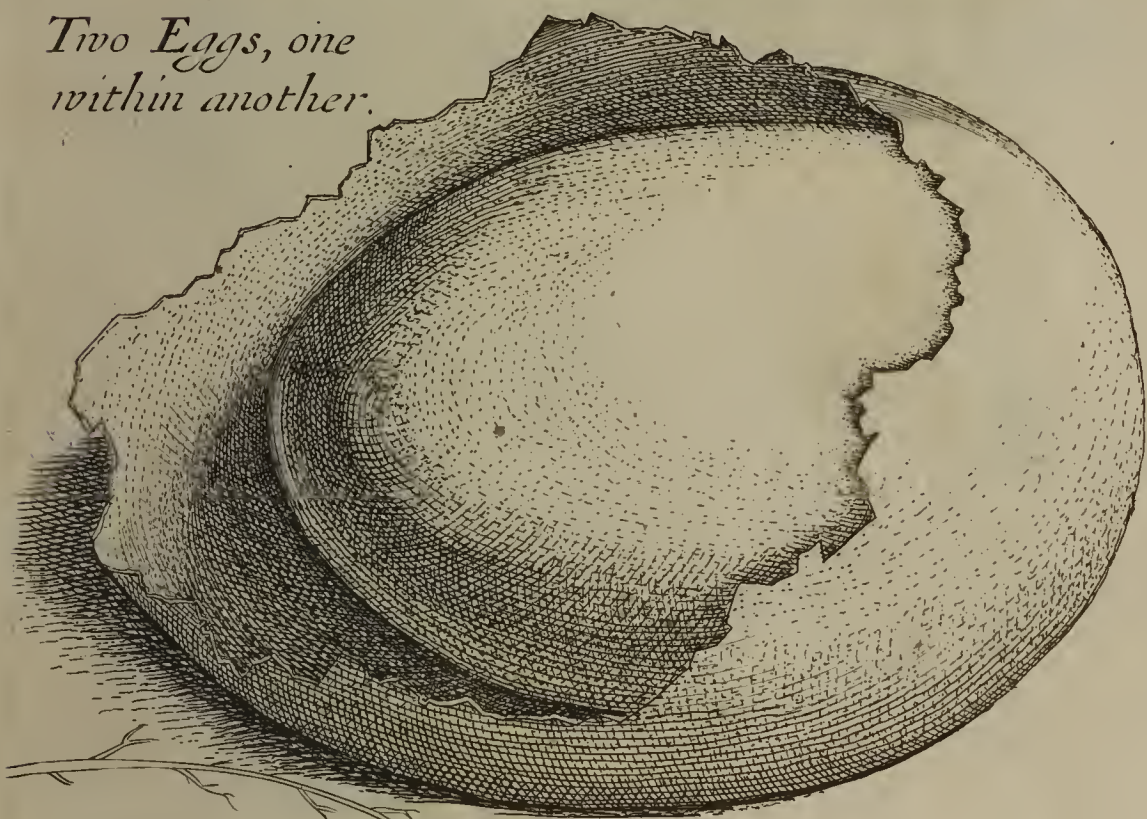


Tab. 6.

Head of y^e Albitros.



Two Eggs, one
within another.

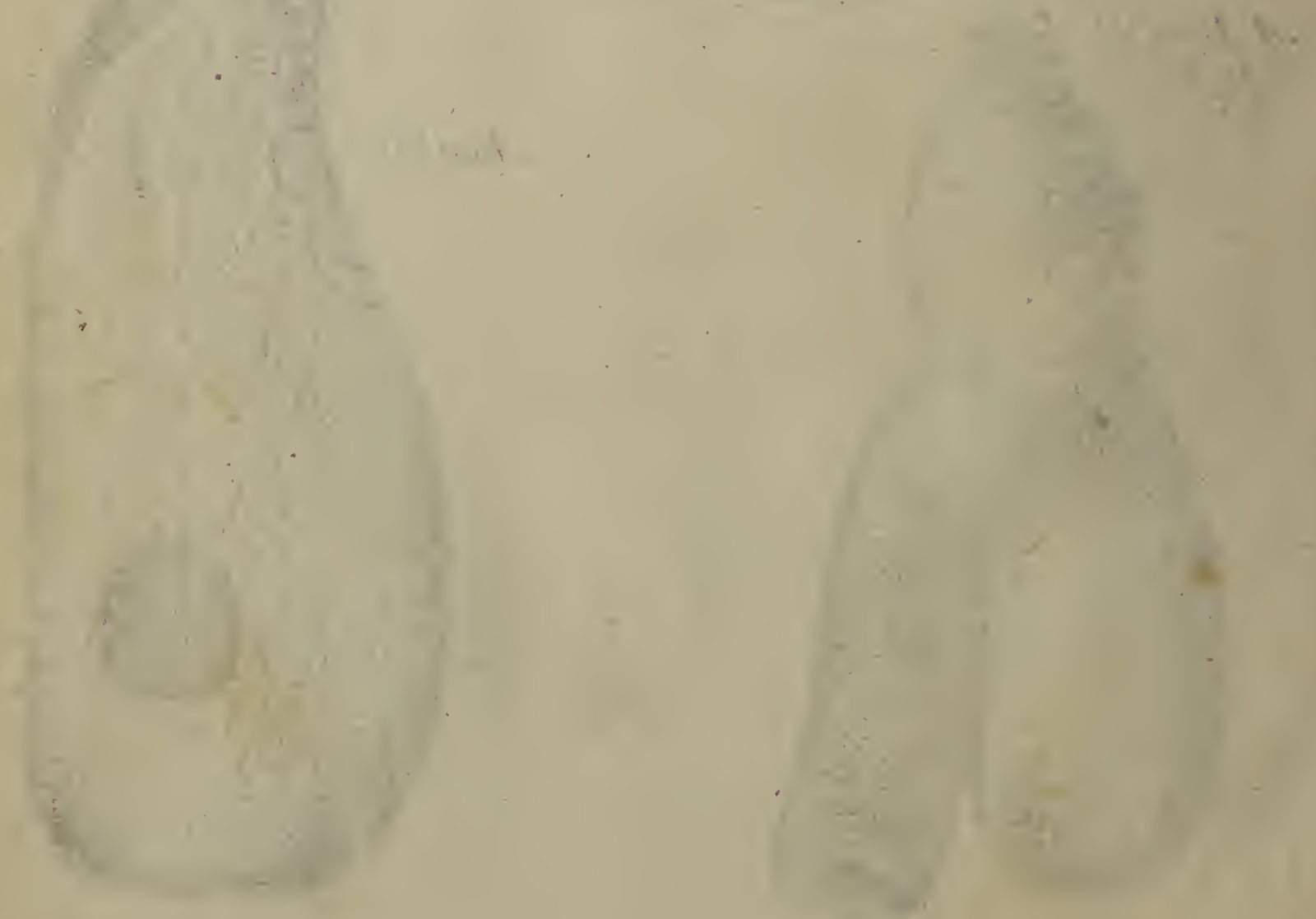
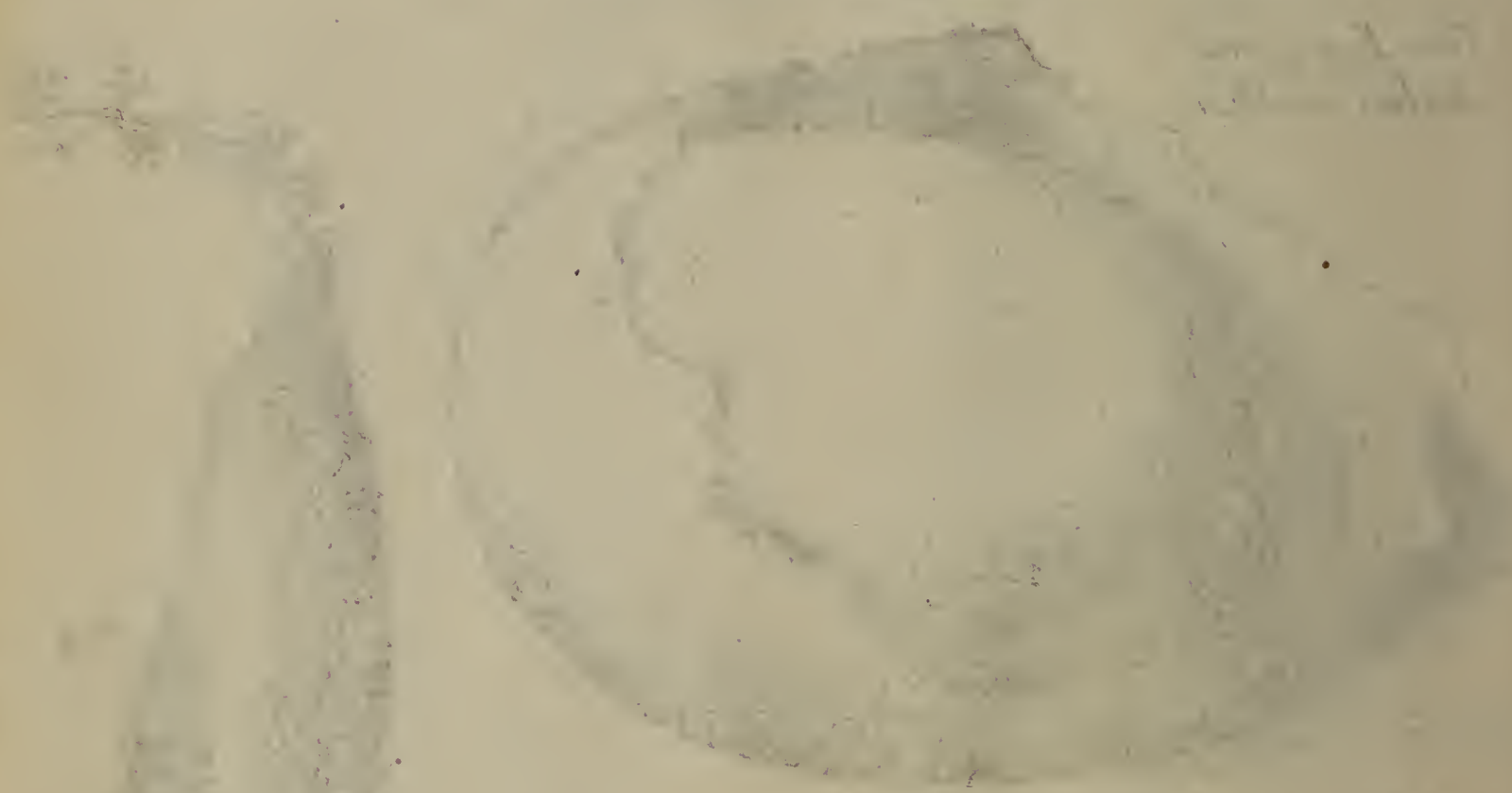
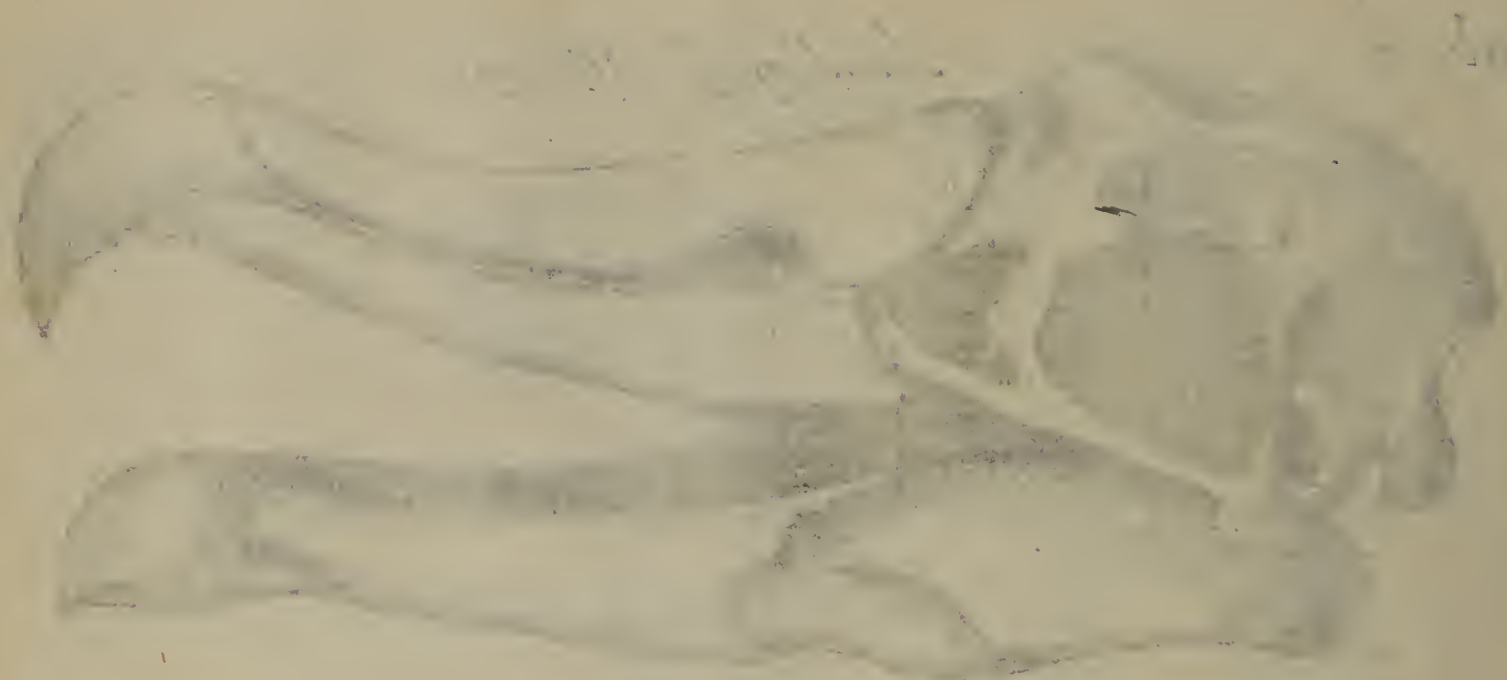


A Bird's
Nest.

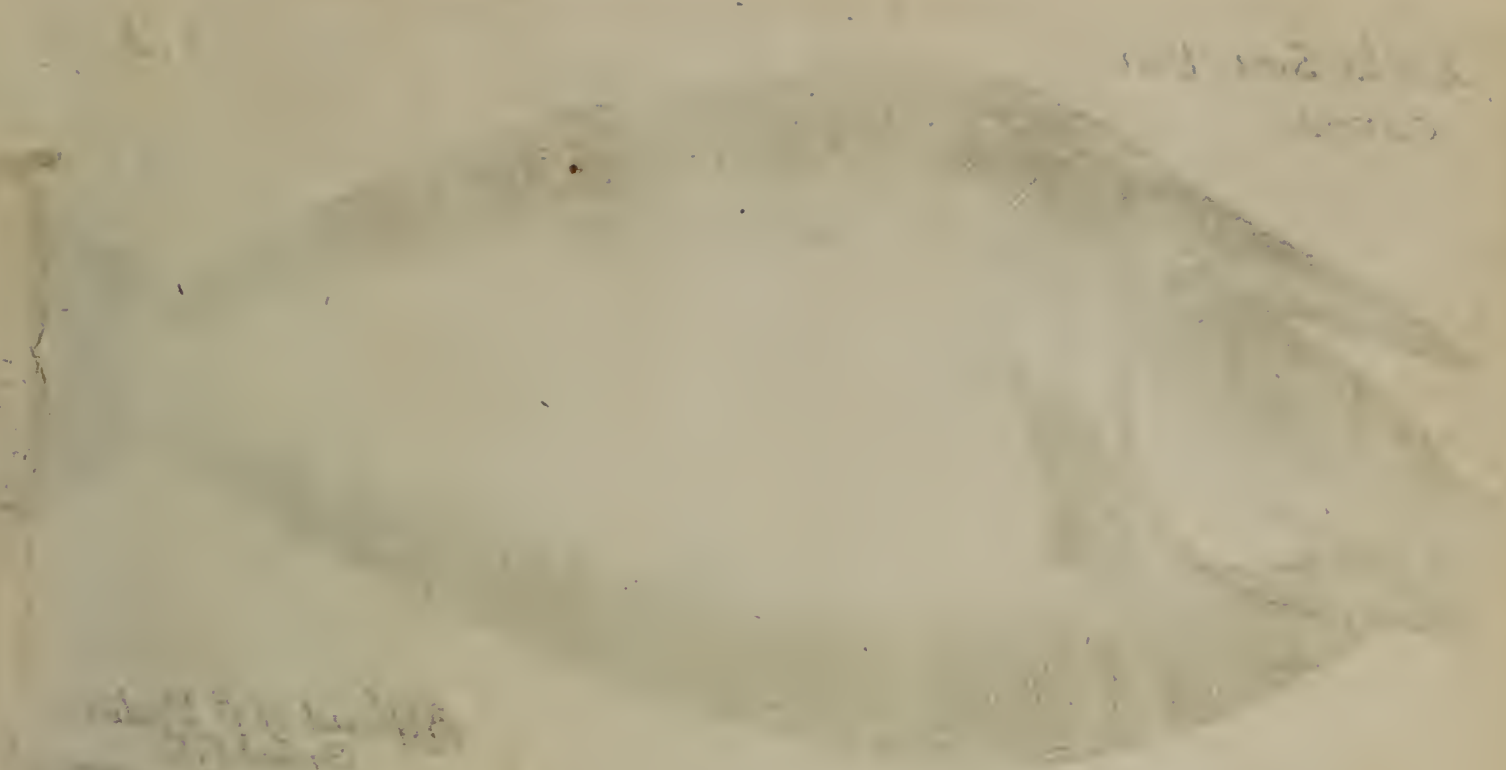


.Another.





sub 1000 1000



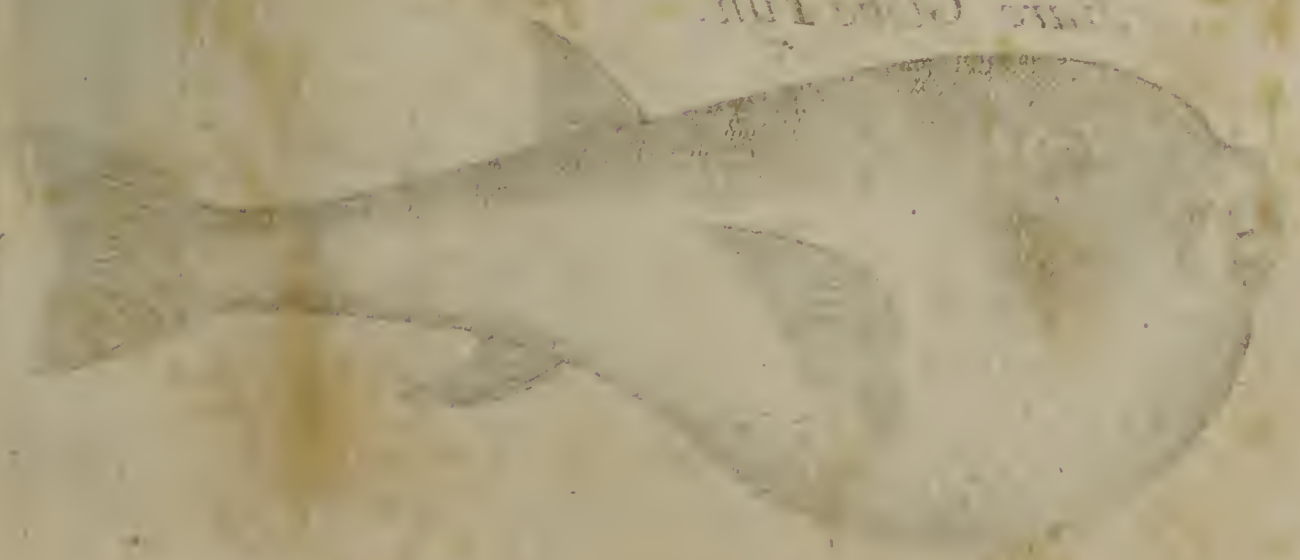
sub 1000 1000



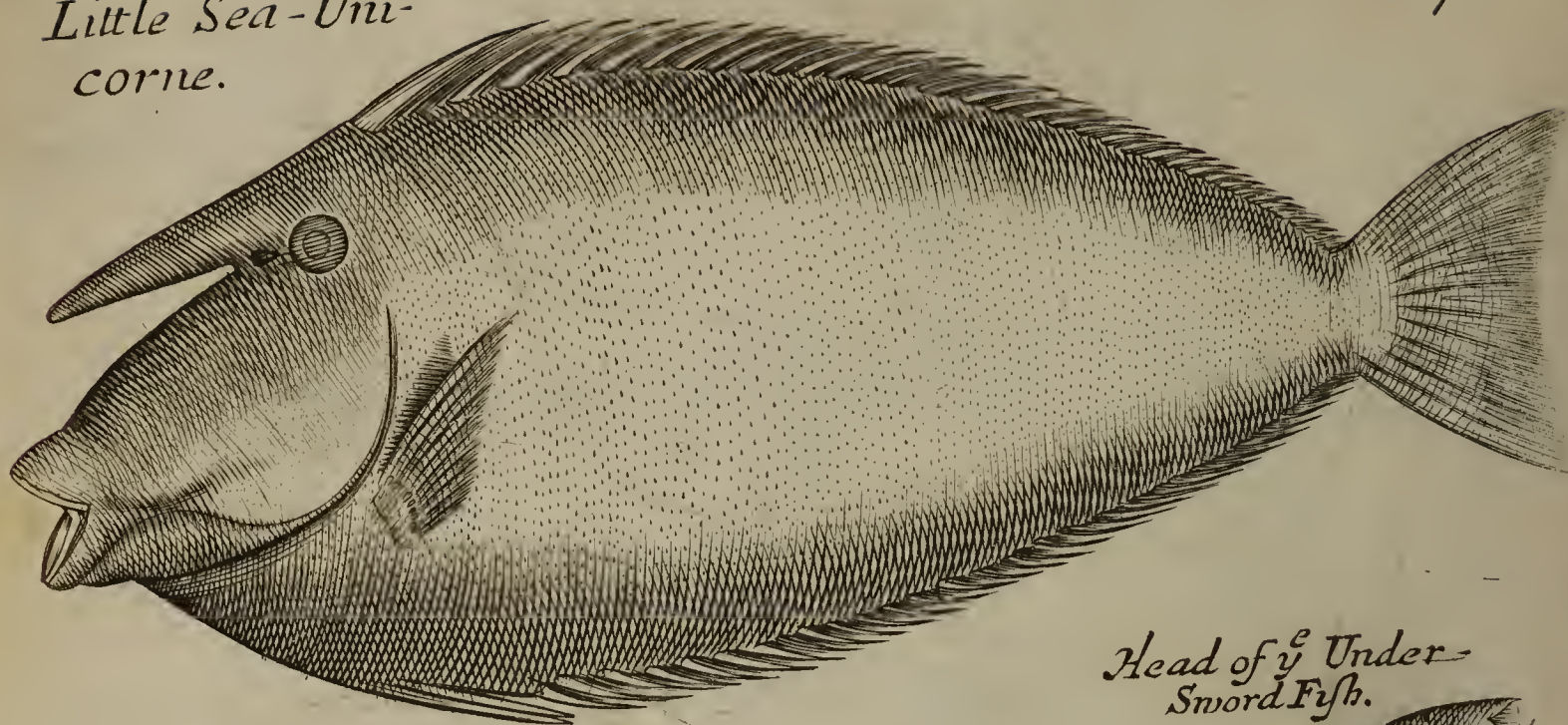
Long 1000 1000



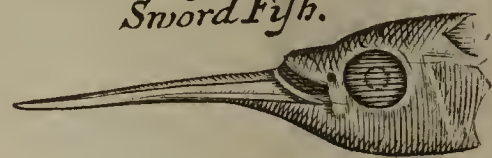
sub 1000 1000



*Little Sea-Uni-
corne.*

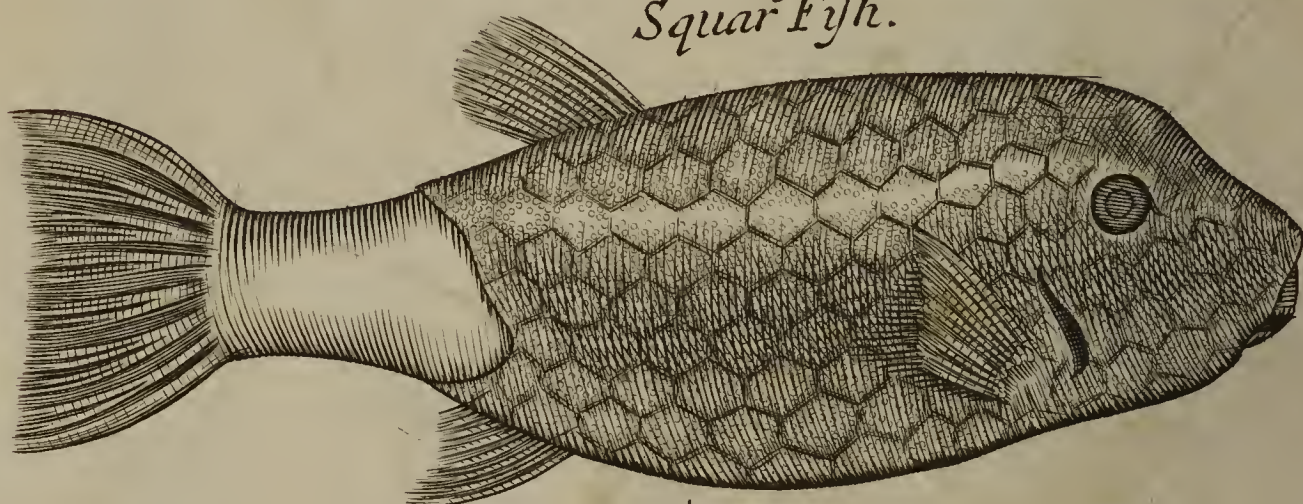


*Head of y^e Under-
Sword Fish.*



20

Squar^e Fish.



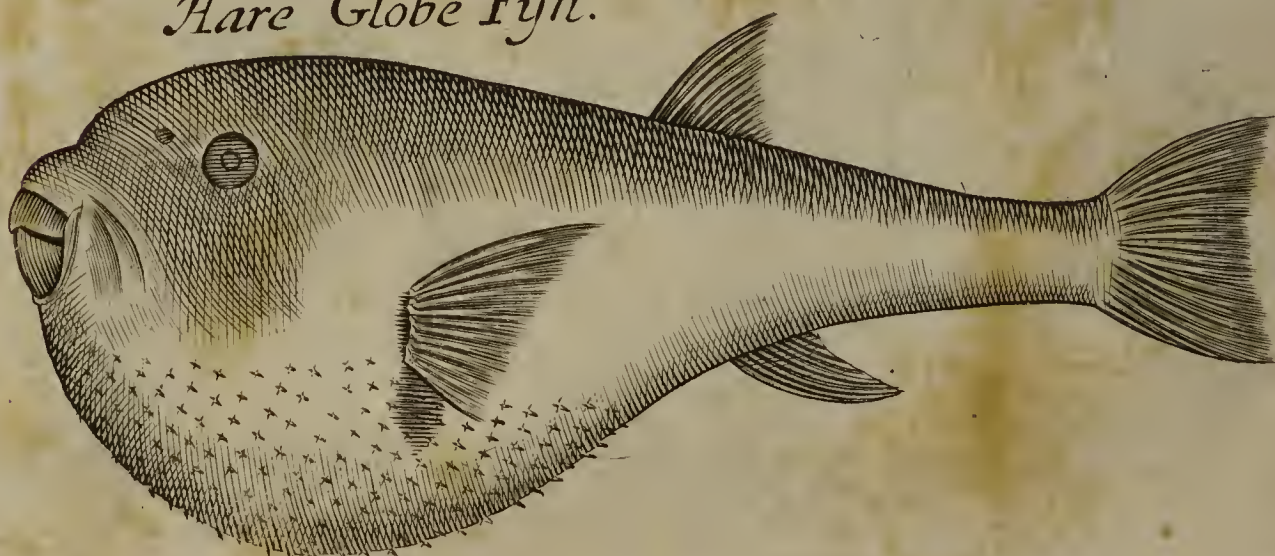
16

Long File Fish.



12

Hare Globe Fish.



4

Inches

Figure 10. *Hydromedusa*



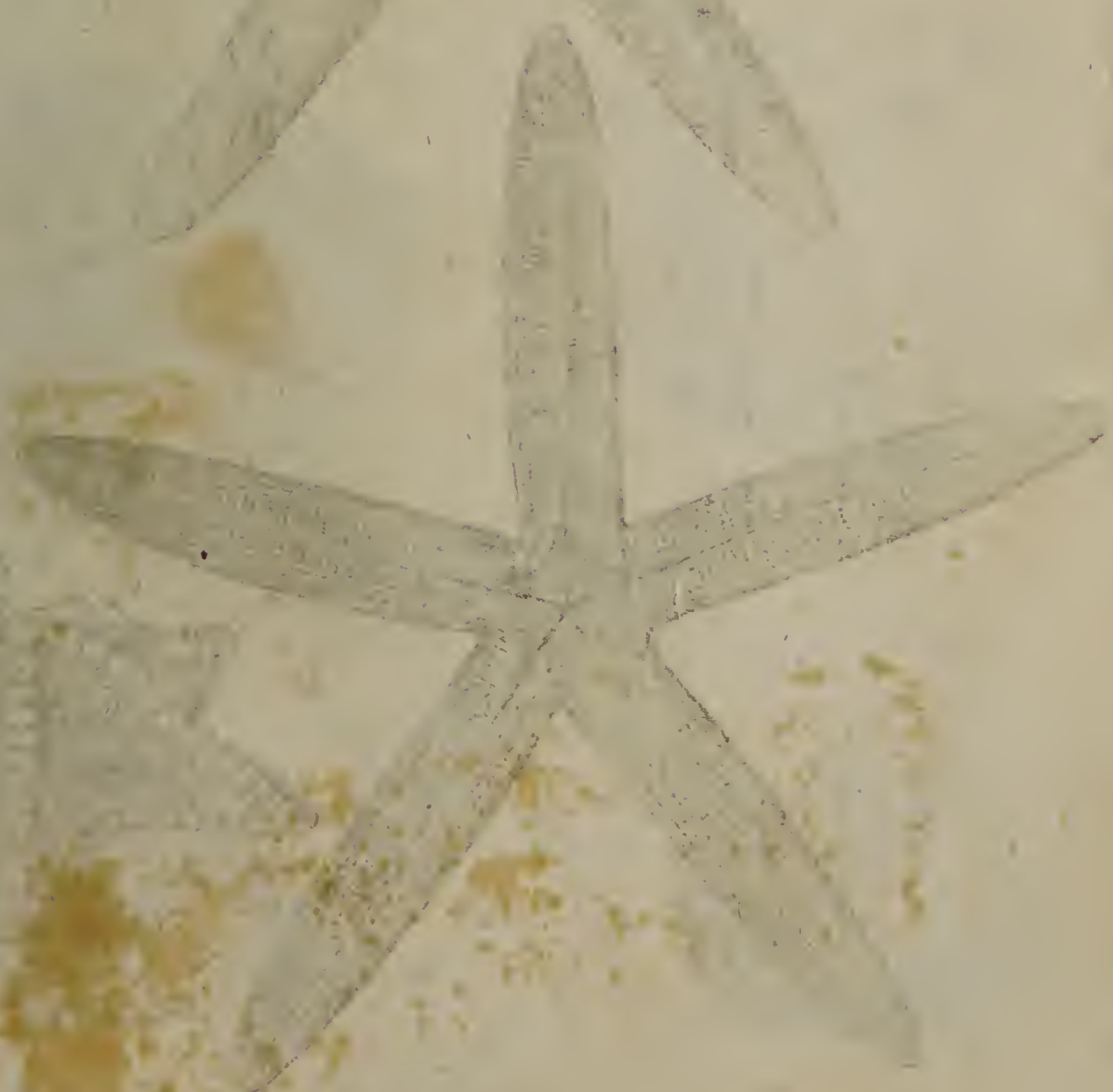
Figure 11. *Hydromedusa*



Figure 12. *Hydromedusa*

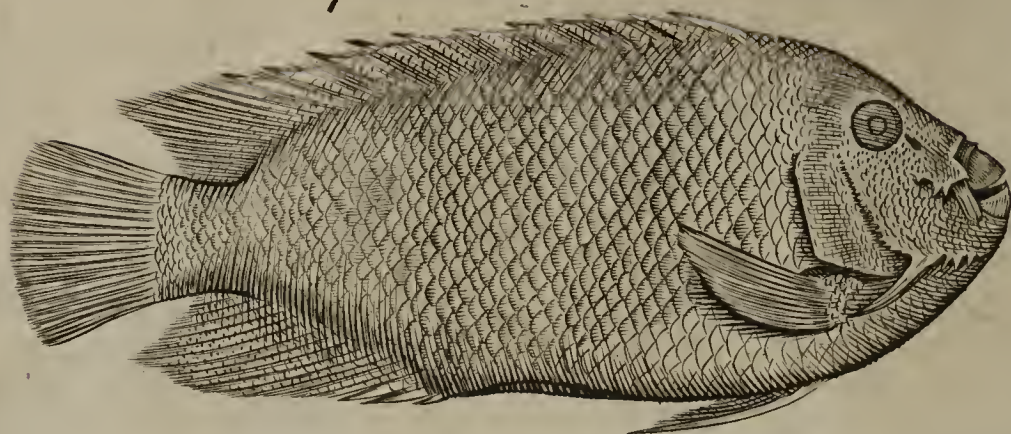


Figure 13. *Hydromedusa*



Square Acarauna.

Tab. 8.

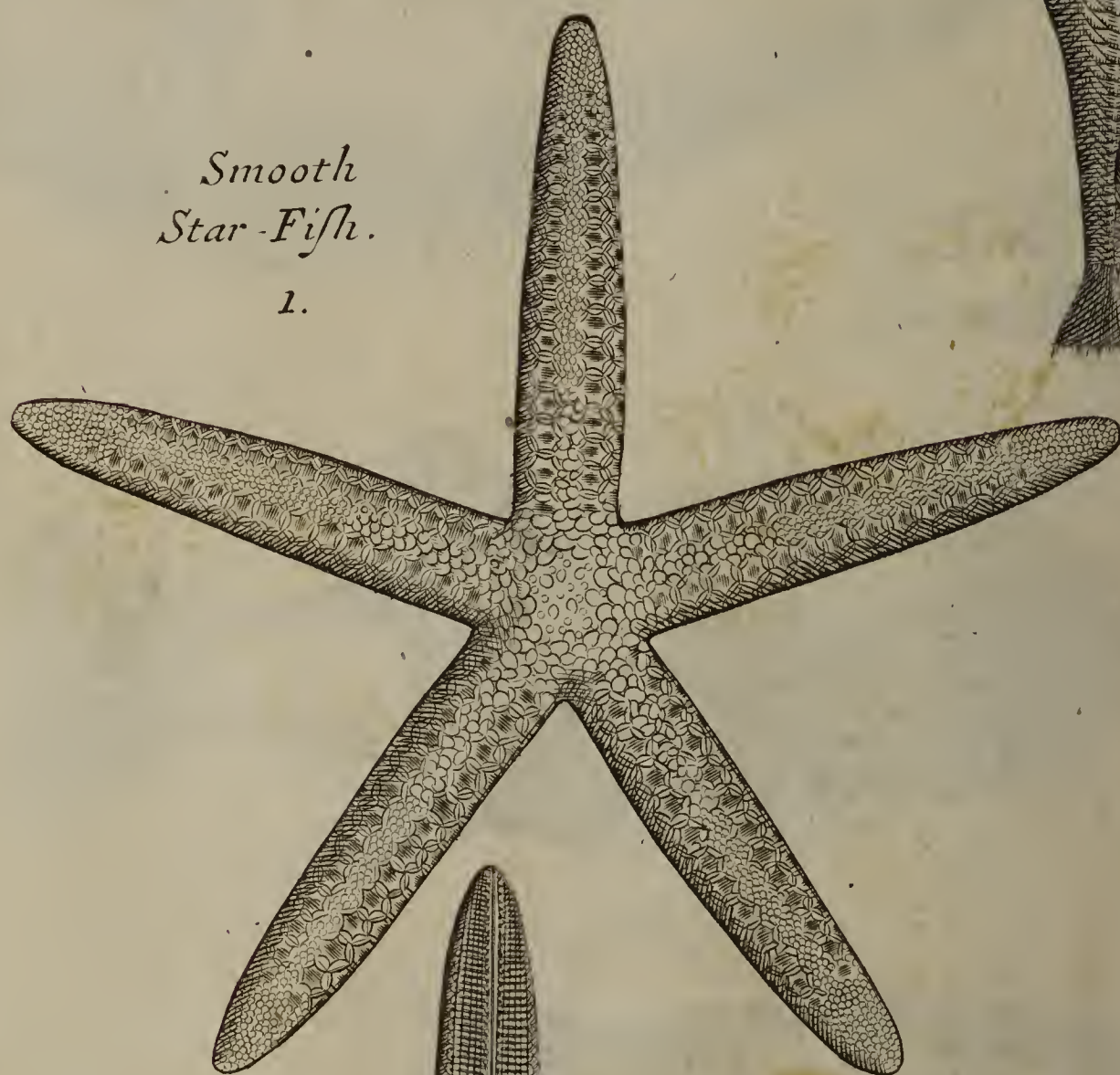


*Mailed Fish of
Brasile.*



*Smooth
Star-Fish.*

1.



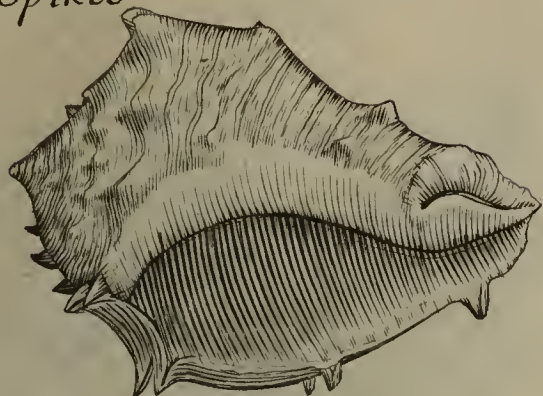
2.



*Crowned
Star-Fish.*



Wilk with plaited
Spikes I

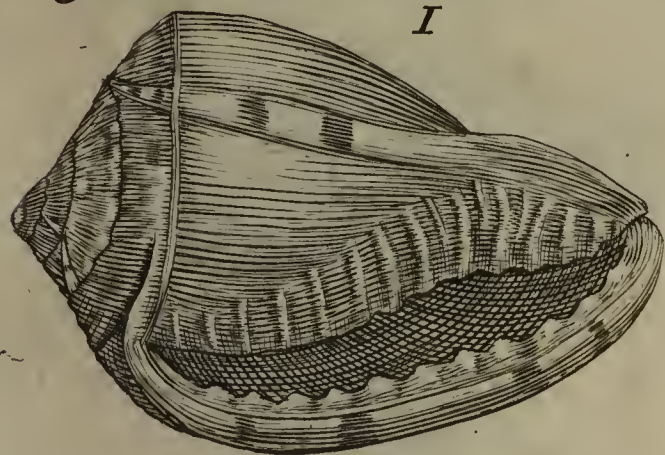


Tab. 9.

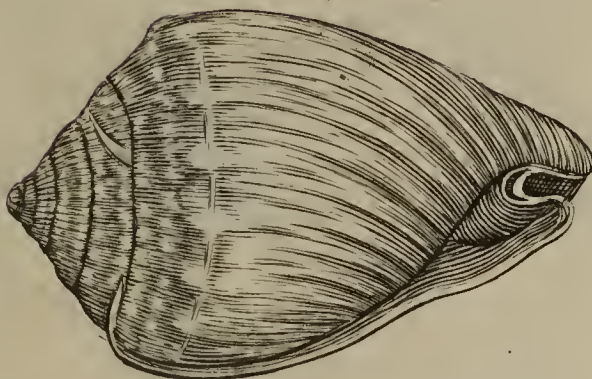
2



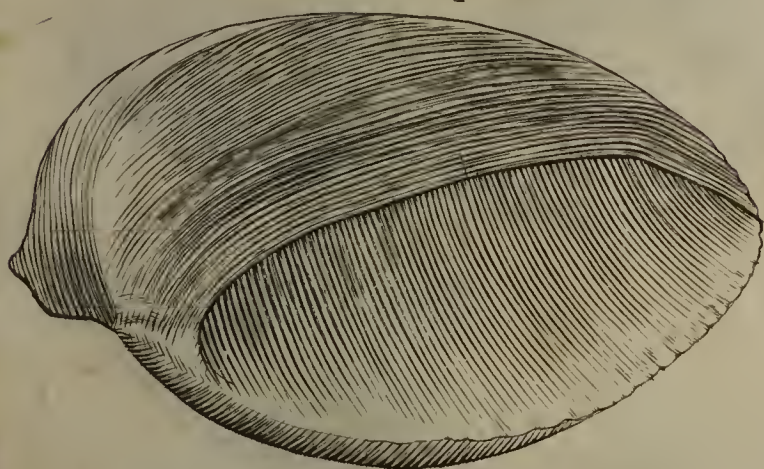
Lesser Persian Wilk I



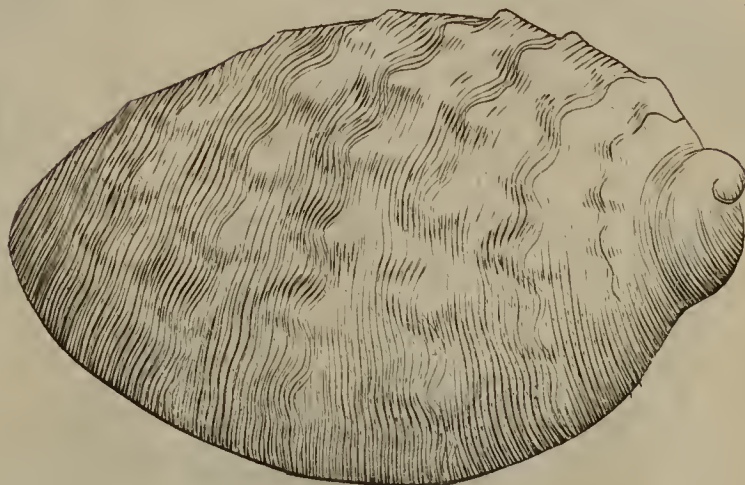
2



Flat Lip'd Snail I



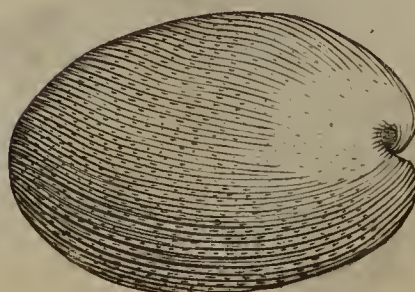
2

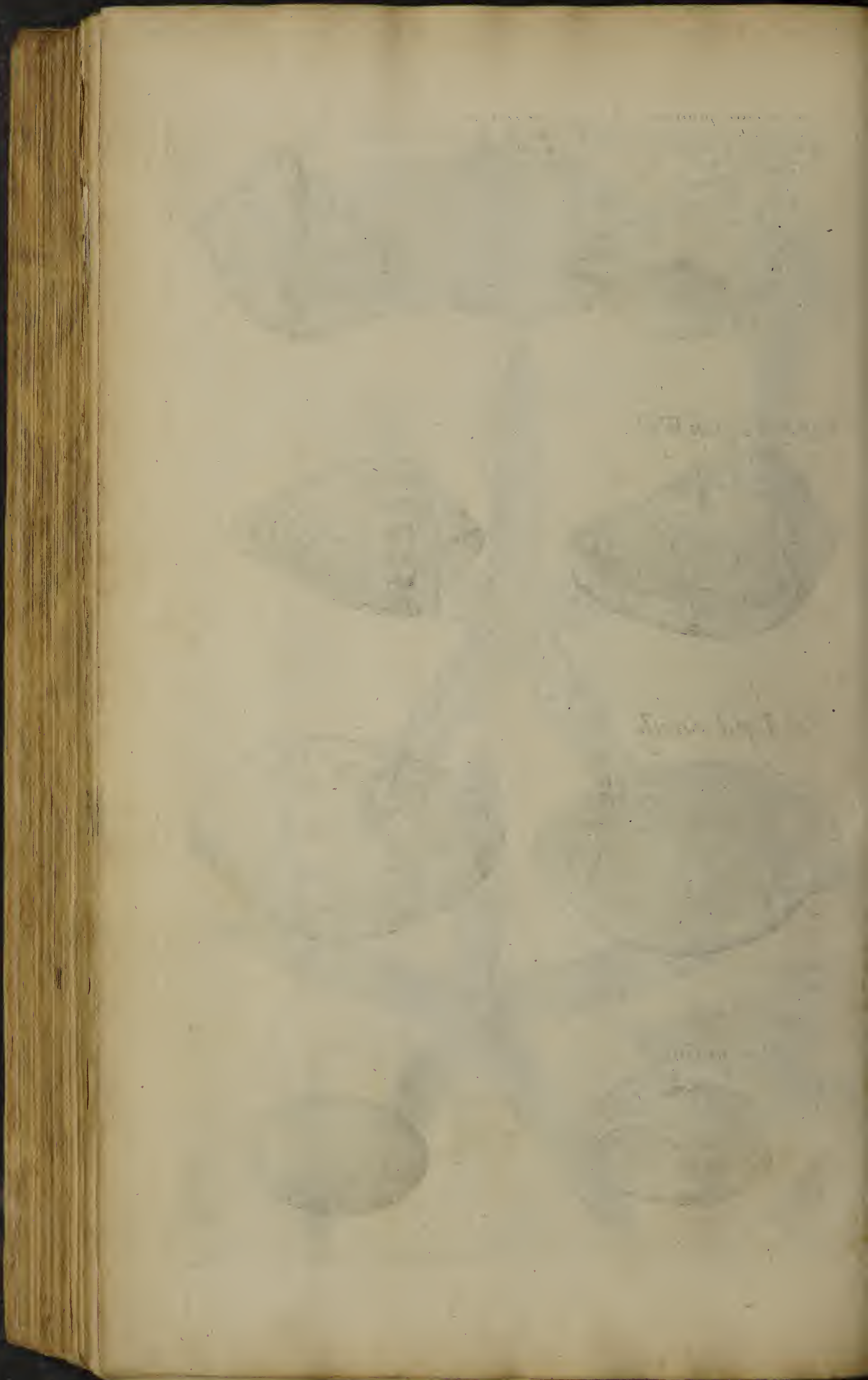


Dipping Snail I.



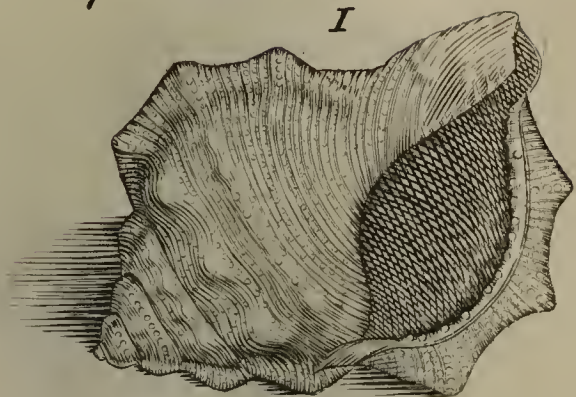
2





Tab. 10.

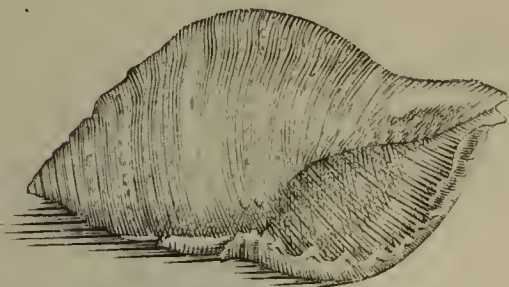
Square Wilk
I



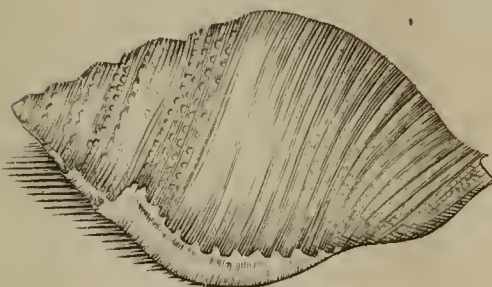
2



Long Square Wilk I



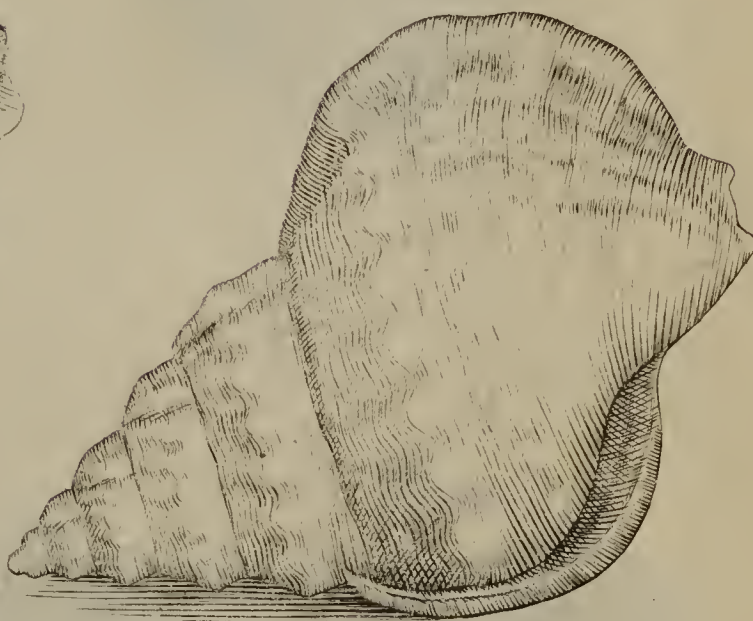
2



Thick Lipp'd Wilk I



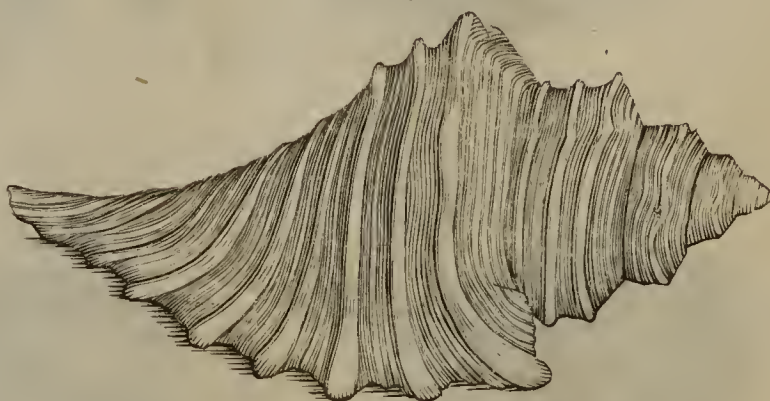
2



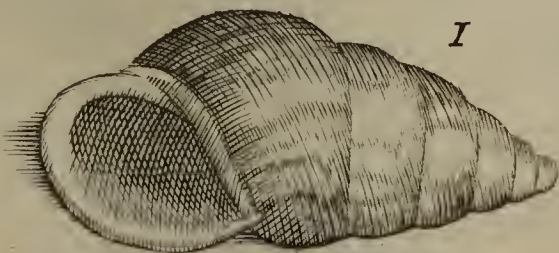
Triangular Wilk I



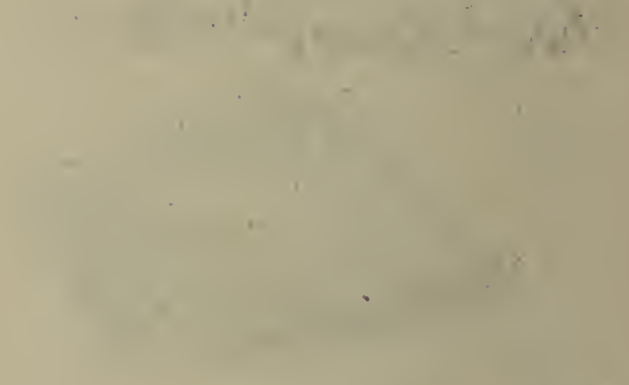
2



Inverted Wilk Snail I



1847



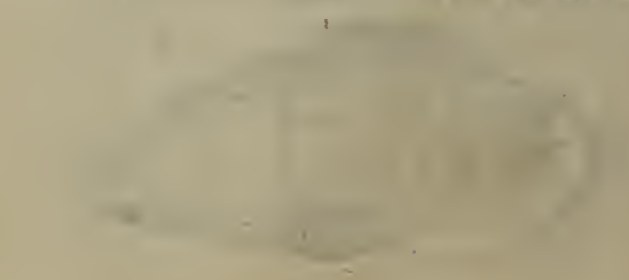
1848



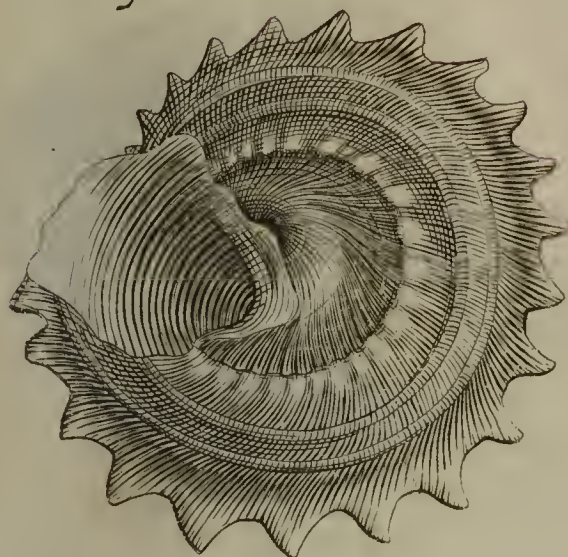
1849



1850

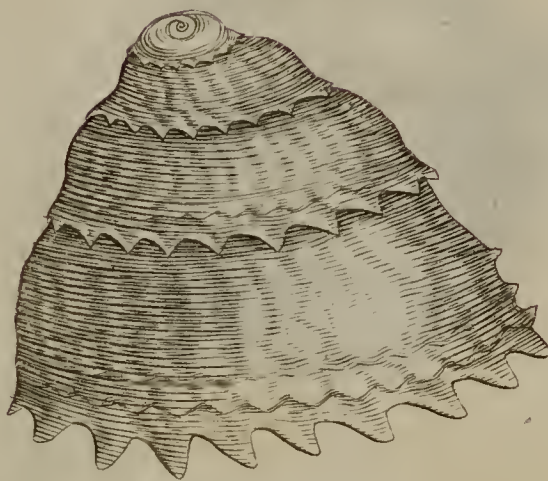


Spiked short Whirle 1

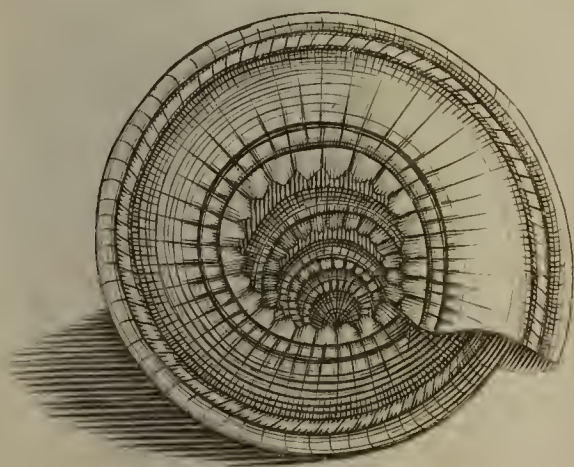


Tab. 11.

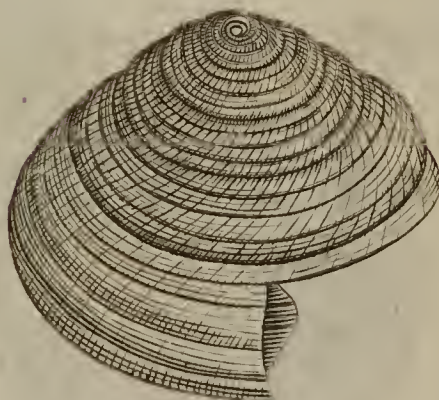
2



Concave short Whirle 1.



2



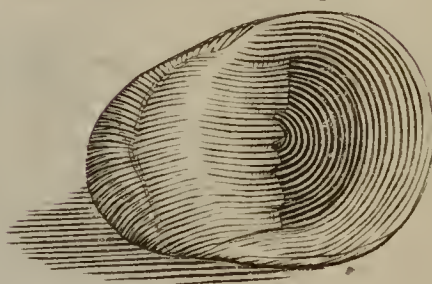
Finger'd Snail 1.



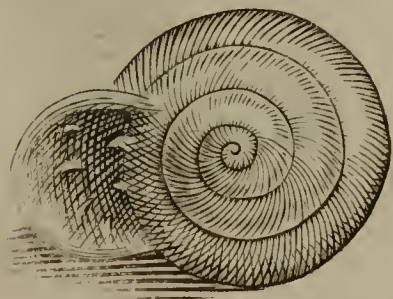
2



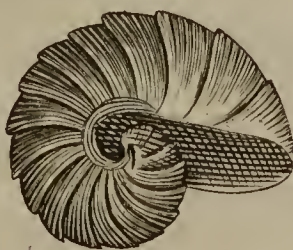
Blober Lip



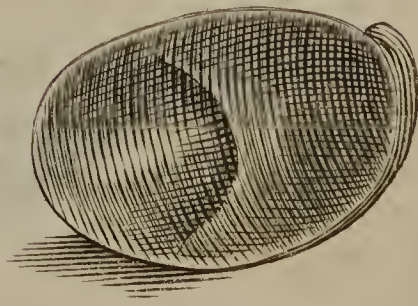
Fore Whirle



Mailed Sailer

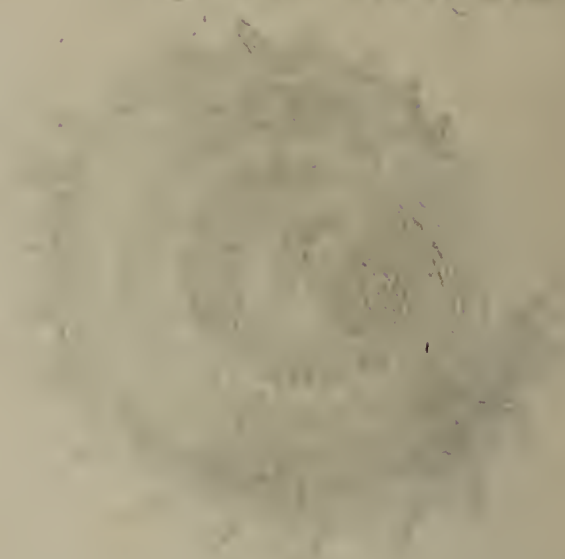


Vaulted Limpet

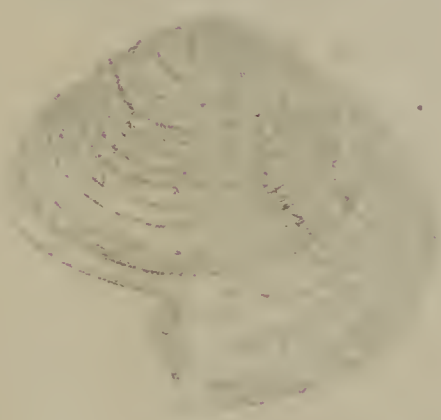


27

Small shell



Small shell



Small shell



Small shell



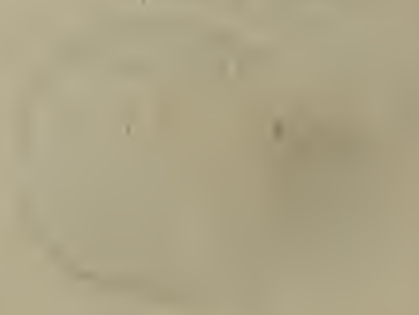
Small shell



Small shell

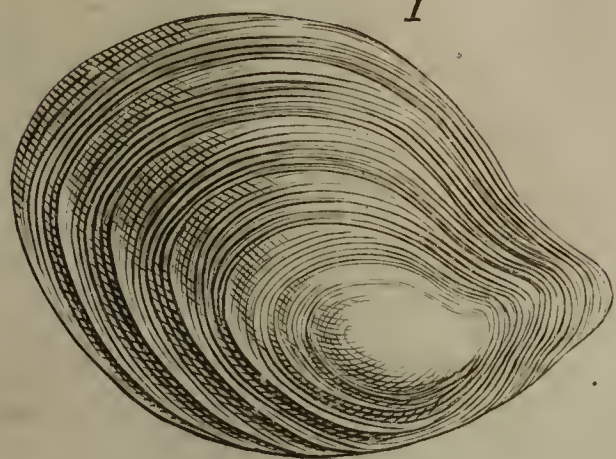


Small shell



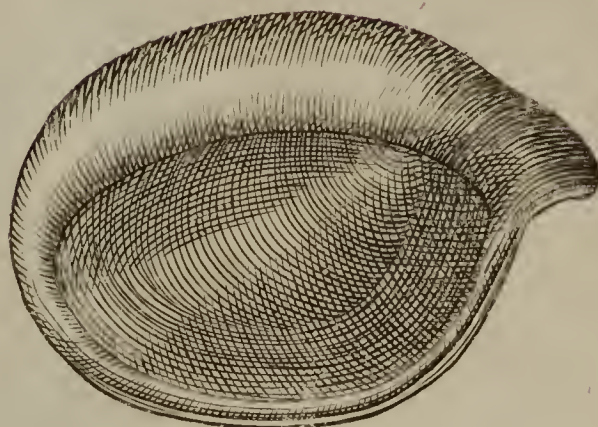
Chestnut Oyster

I

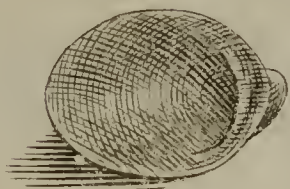


Tab. 12.

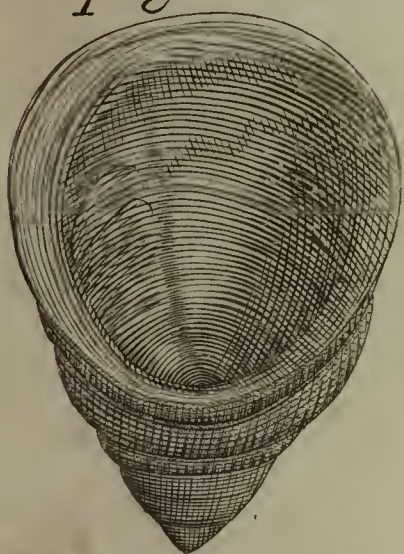
2



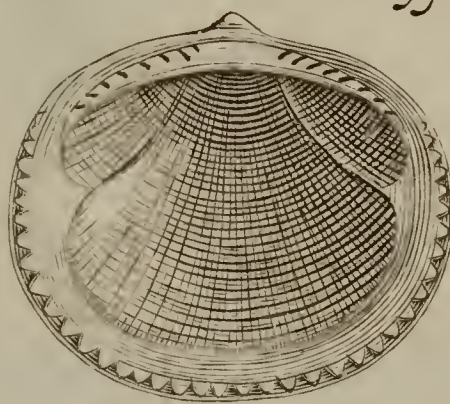
Neted Shell



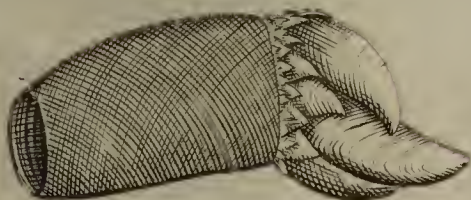
Conick Limpet,
Sloaping



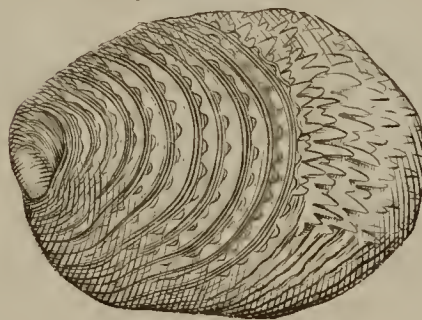
Multarticulate Oyster



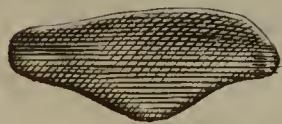
Scaled Centre-Shell



Rugged Oyster



2



Blob Lip'd Muscle

1



Fig. 1. 1840

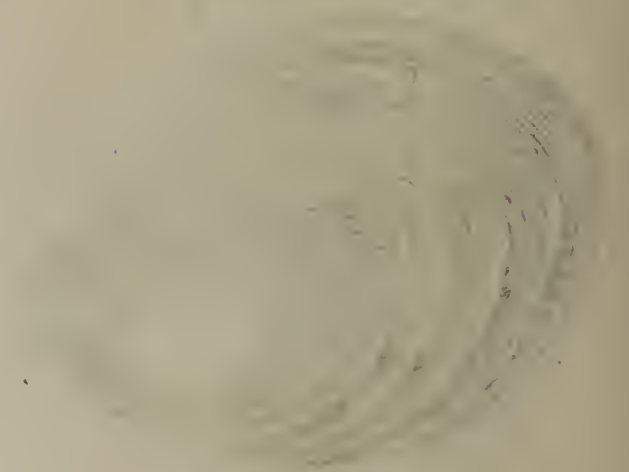


Fig. 2. 1840



Fig. 3. 1840



Fig. 4. 1840



Fig. 5. 1840



Fig. 6. 1840



Fig. 7. 1840

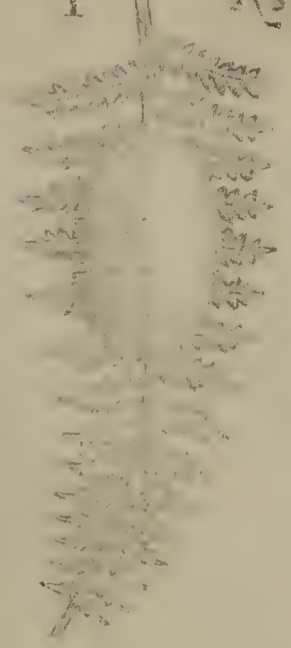
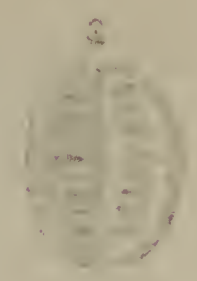


Tab 13

Fig 11st

1

Fig 12nd



2

3



Fig 13th

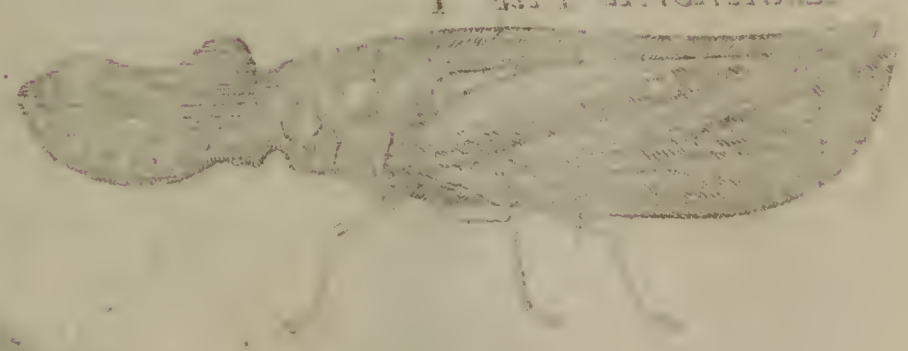
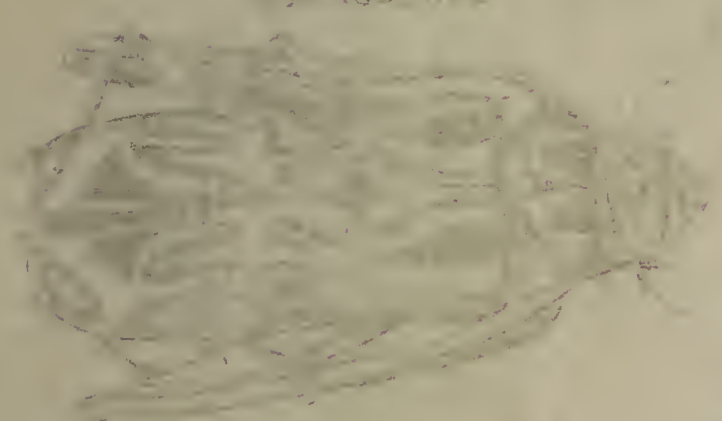


Fig 14th



2

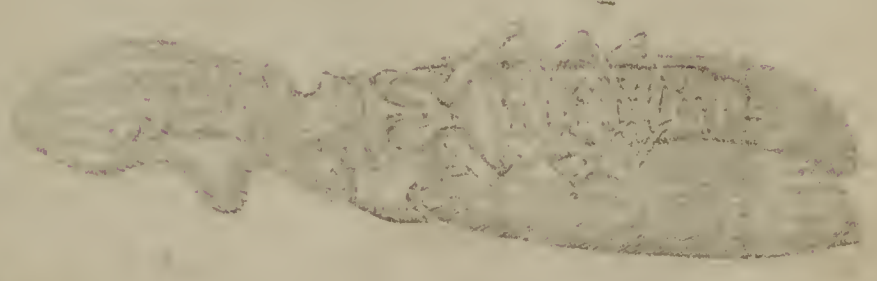


Fig 15th



Fig 16th

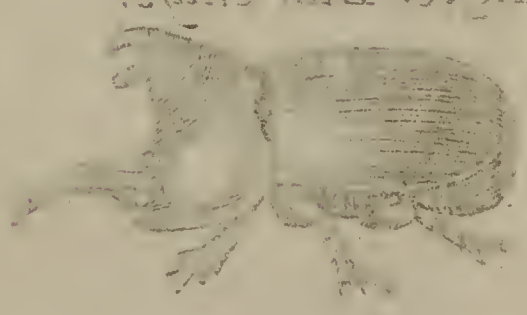


Fig 17th



Fig 18th

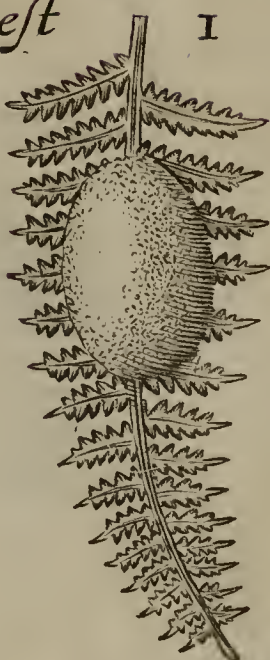


Tab. 13.

Fly Nest

I

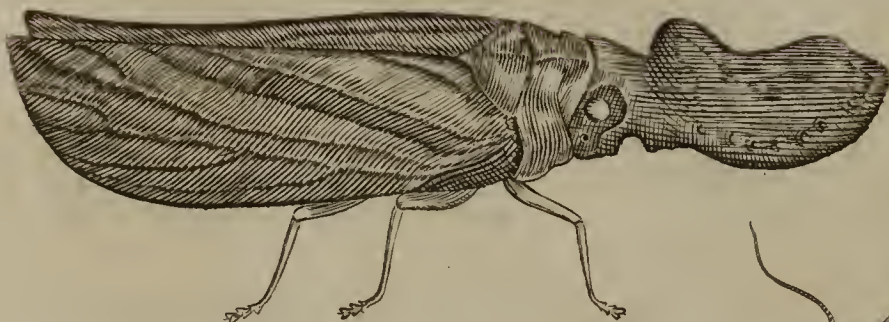
Wild Bee I



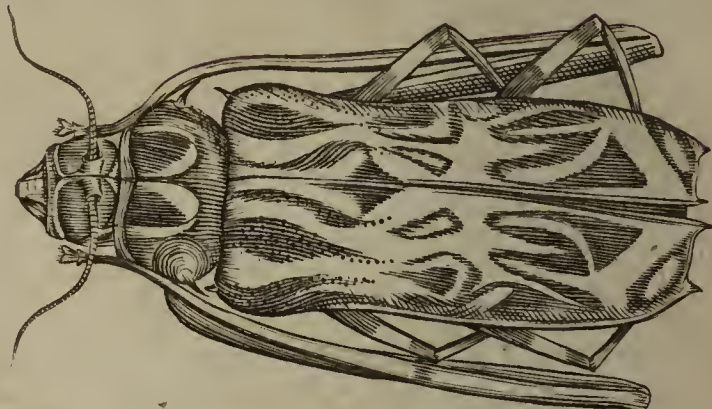
3



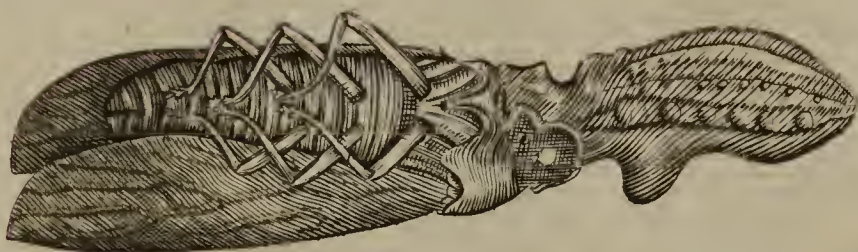
Lanthorne Flie I



Nöcoonaca.



2



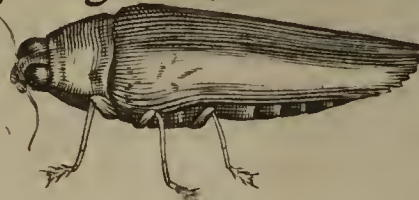
Great Gogle Ey'd Beetle



Lesser Bull Chafer



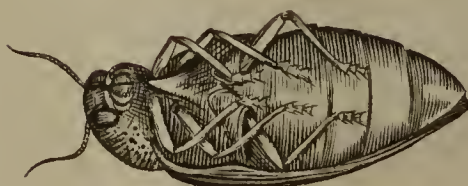
Long Gogle Ey'd Beetle



Thick Gogle Ey'd Beetle I



2



Antique Shell
Green River



Top of



Small Shell
Antique



Small Shell
Antique



Small Shell
Antique



Small Shell
Antique



Small Shell
Antique



Small Shell
Antique

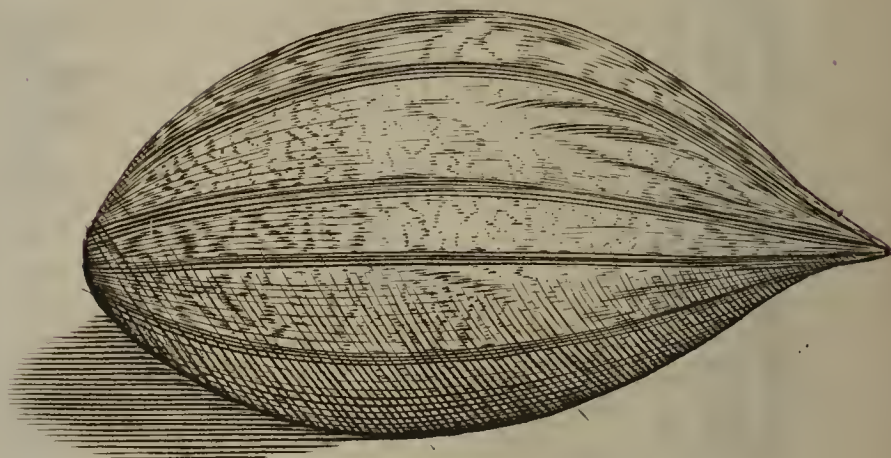


Tab. 14.

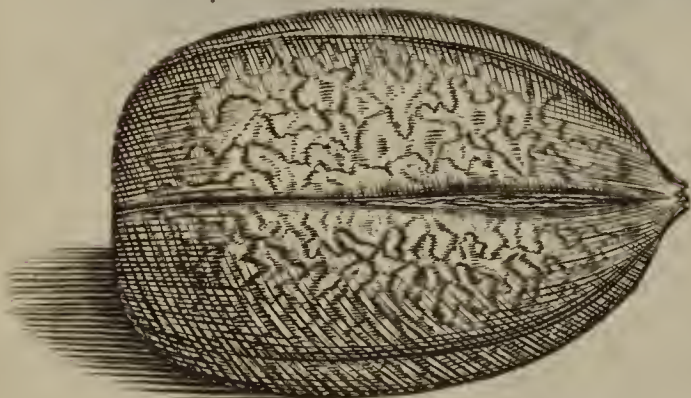
Trivalvours.



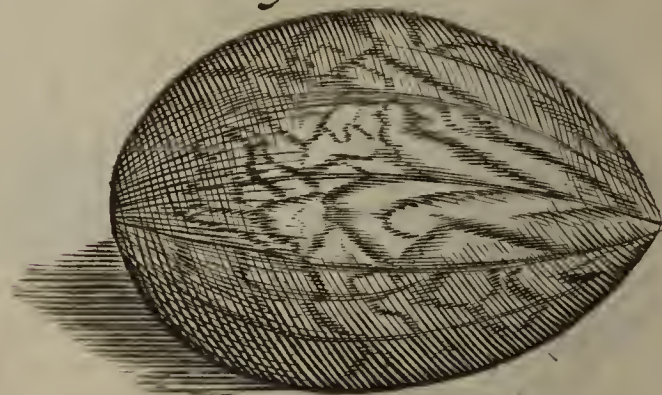
Indian Plum-stones.
Great, Poynted.



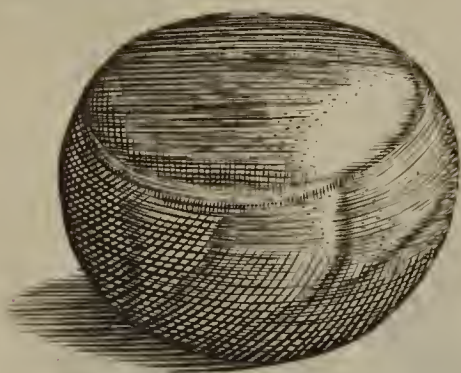
Quinquevalvours,
Oval.



Woody Oval.



Round Mammee.



Woody, Orbicular.



Orbicular,
Tuberous.

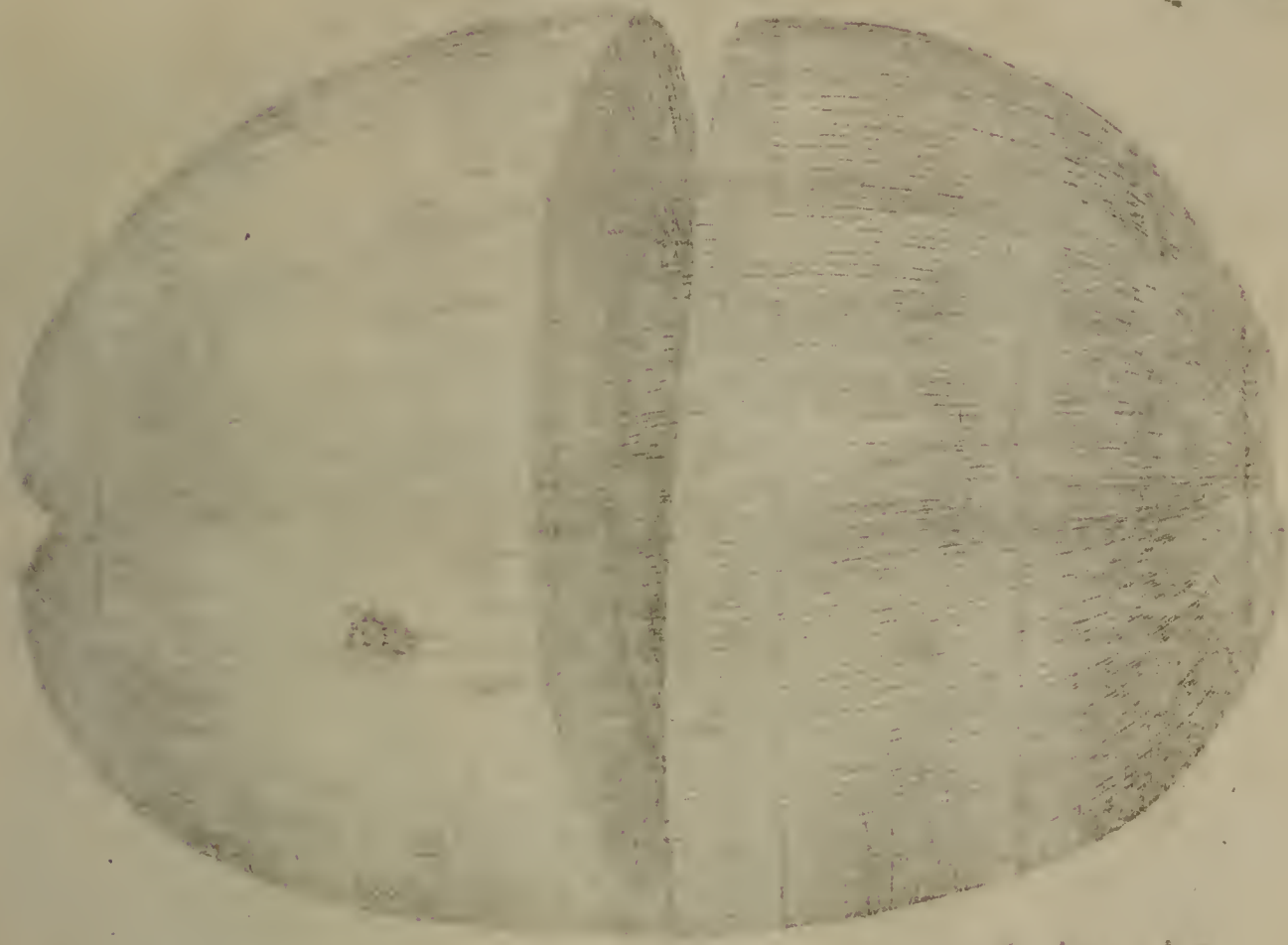


Quinquevalvours,
Orbicular.

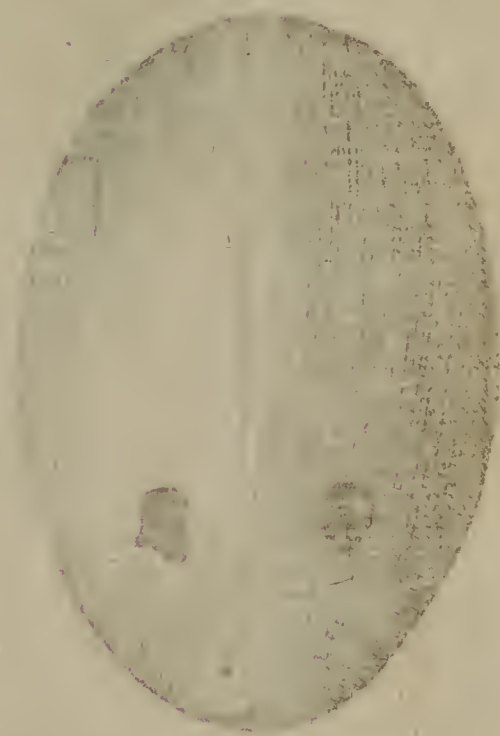


Tab. 12.

Coco Nut



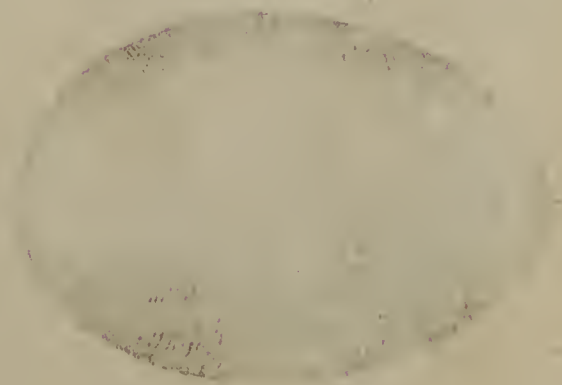
The shell



Coconut

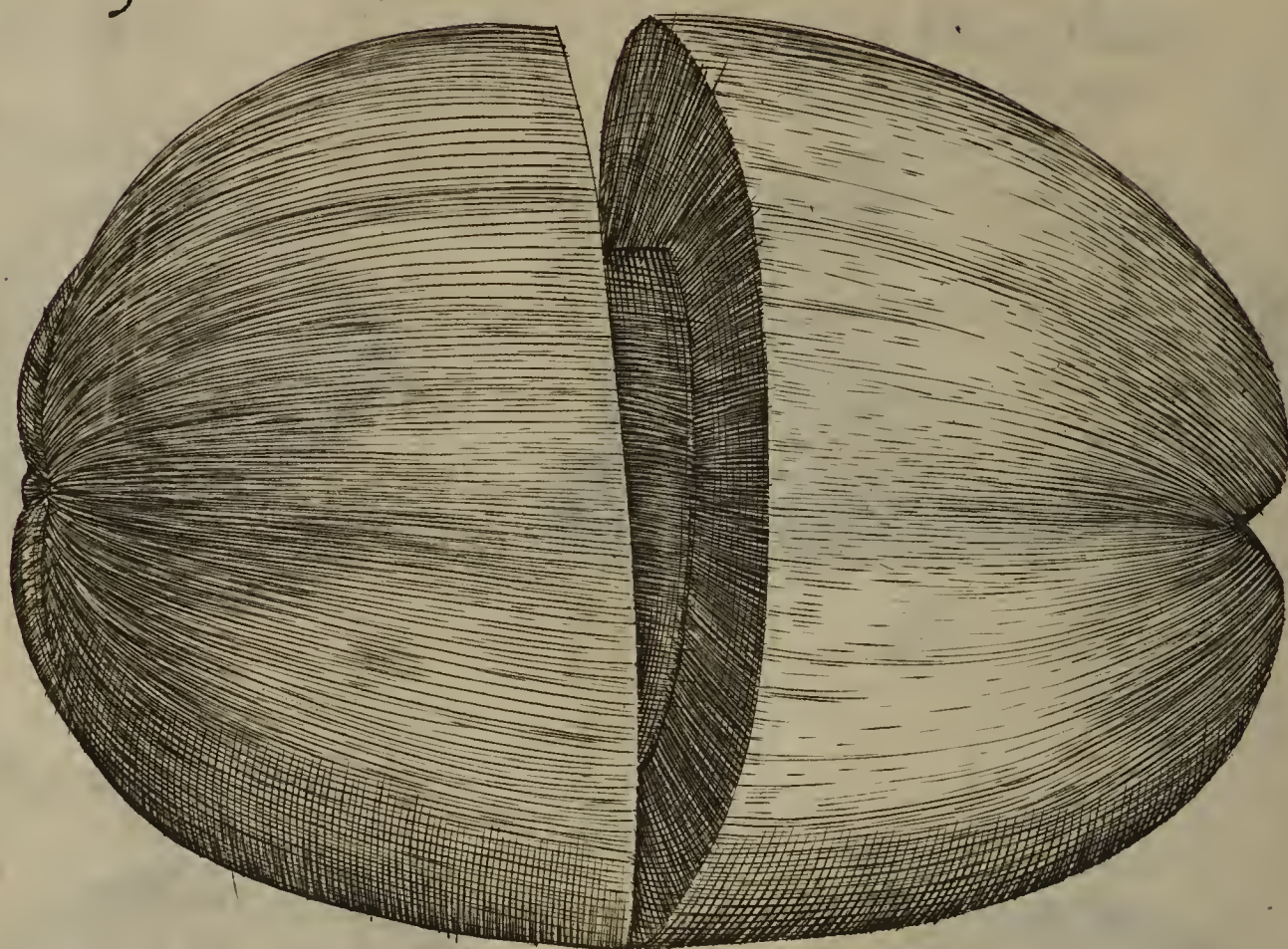


Coconut



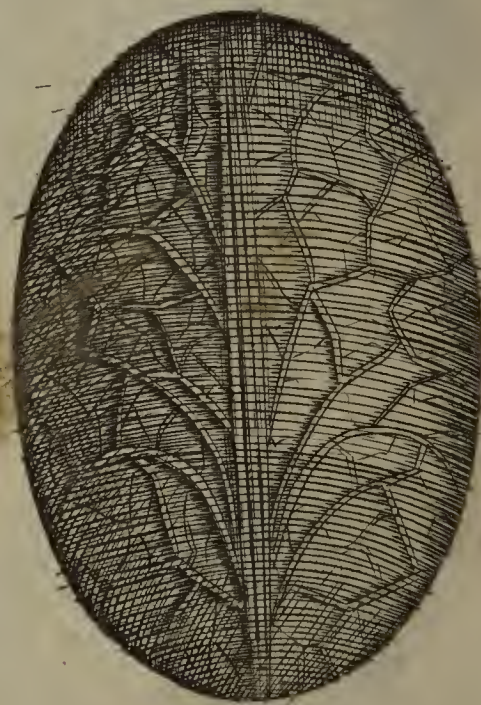
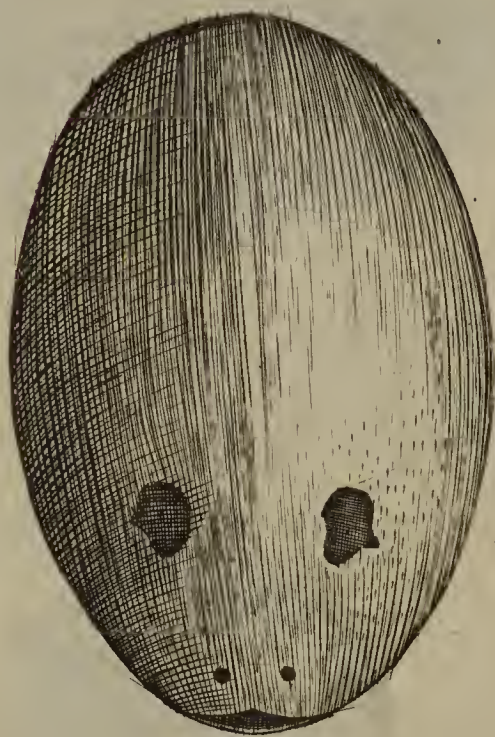
Coconut





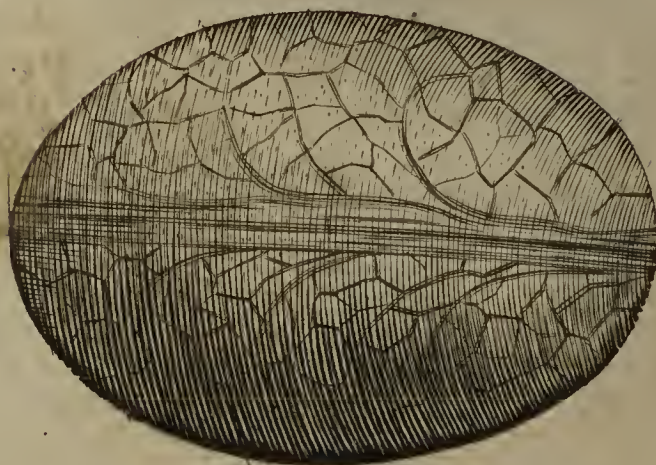
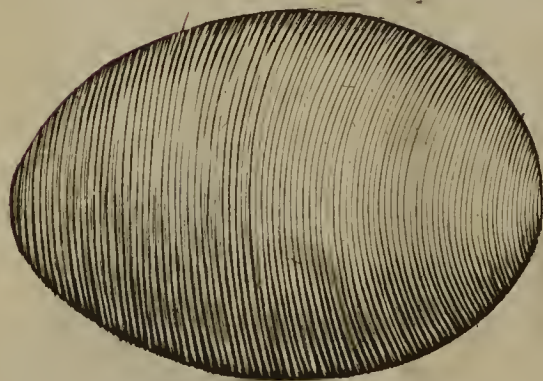
The Shell

Outward Coat

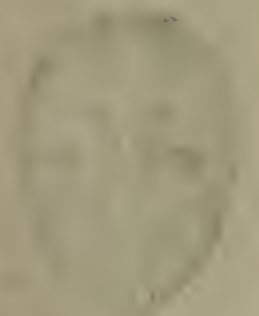
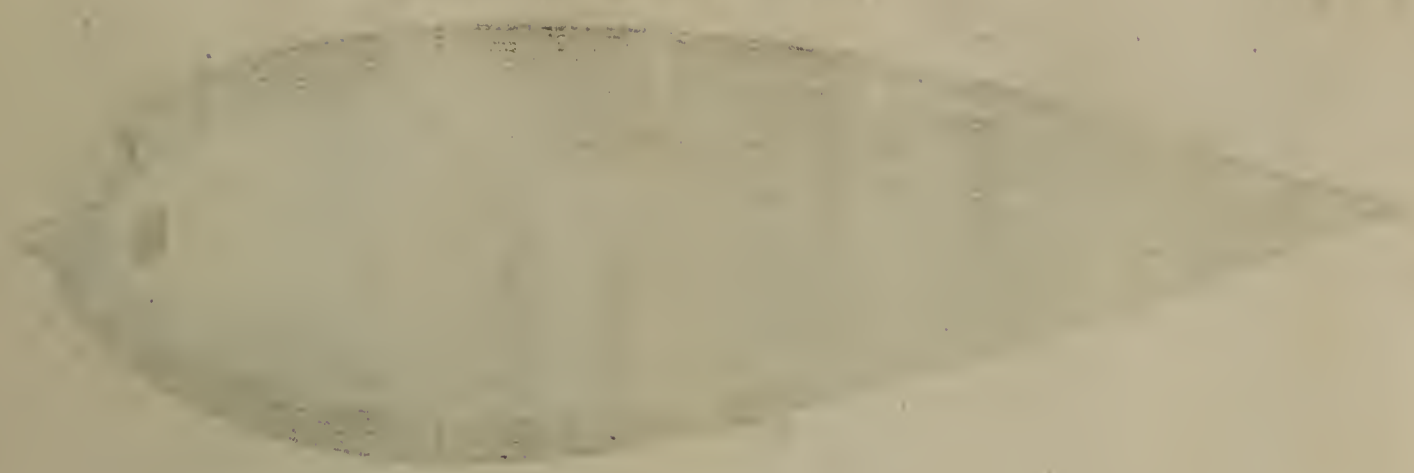


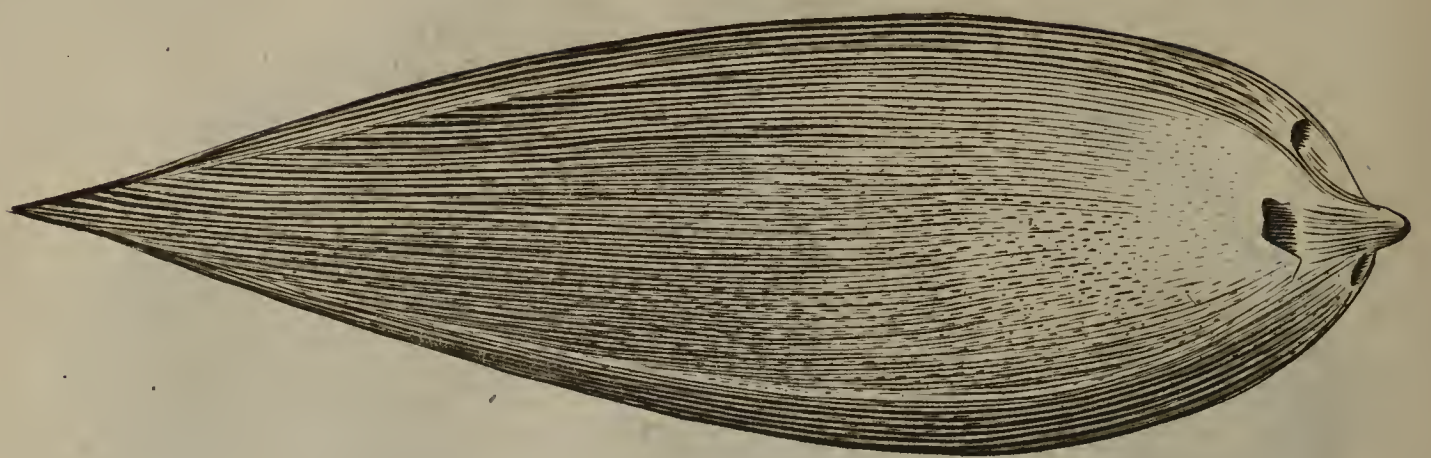
Kérnel

Inward Coat

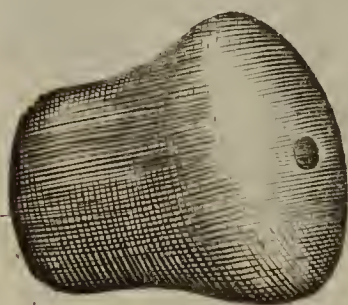


Inches





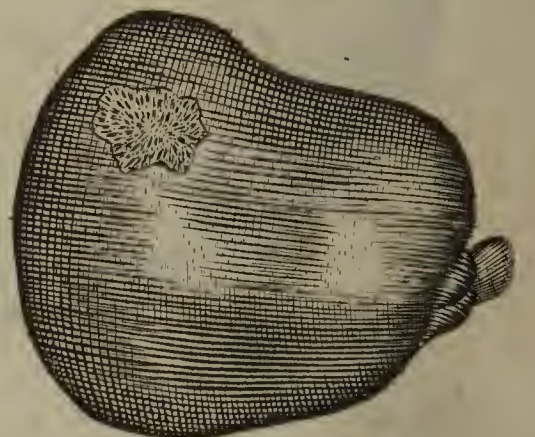
The Stone 2.



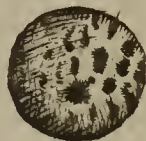
The Kernel.



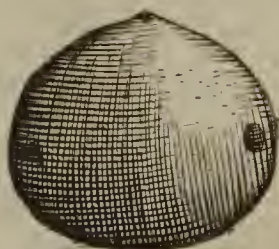
Date-Nut 1.



Round Palmacoco.



Broad Palmacoco



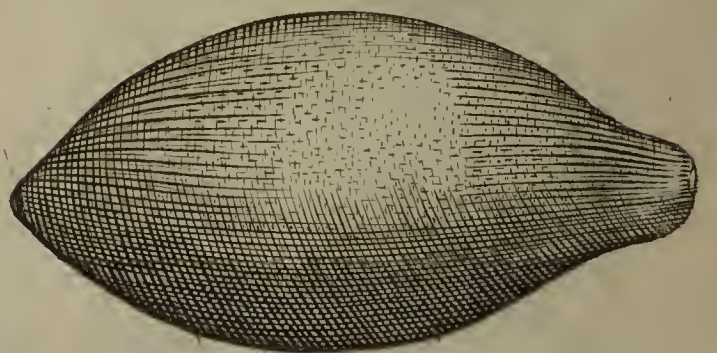
2



Dog-Palmacoco 1.



Butter-Nut 1.



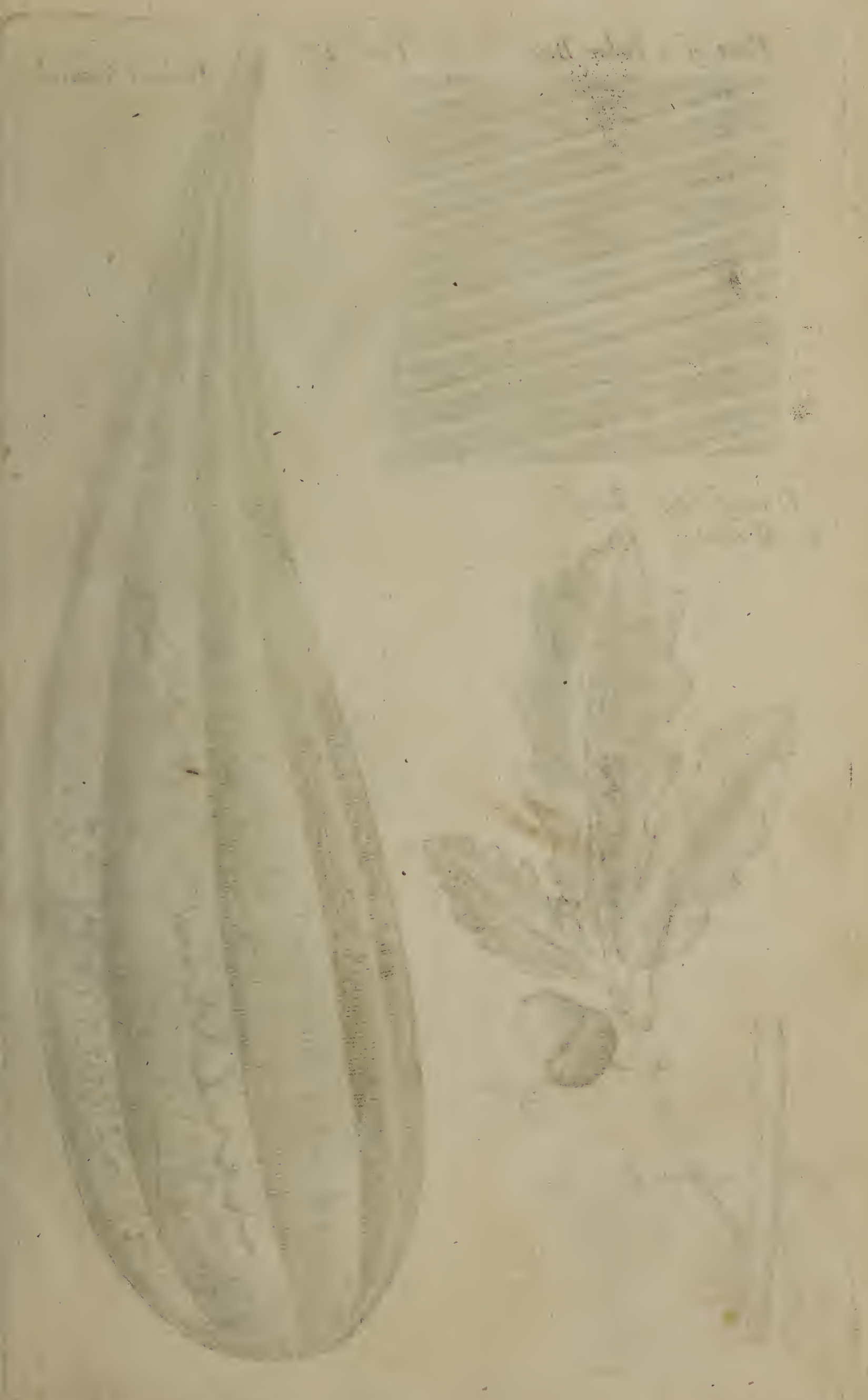
The Stone 2.



Indian



Filbert.



Part of a Palm-Bag



Tab. 17

Indian Gourd



*Dwarf Oak Leaf
& Akorne*

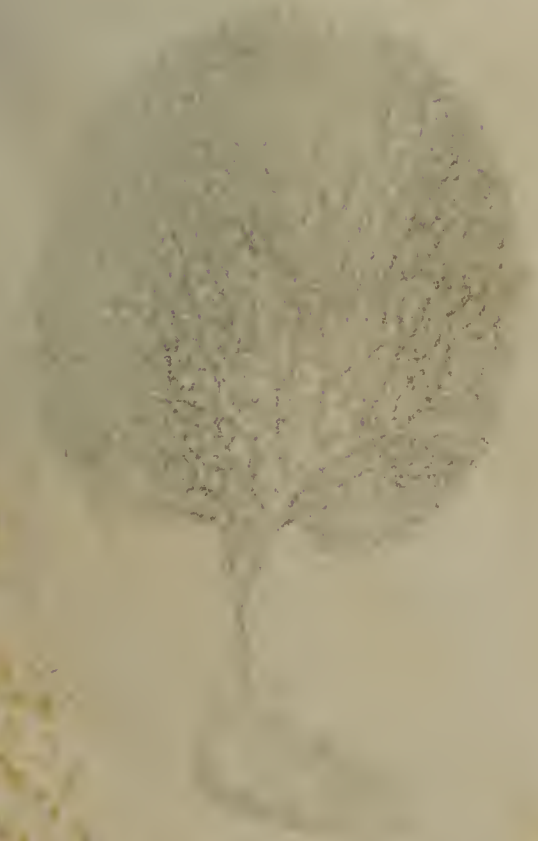


21. 10. 17

Handwritten title or description at the top right.



Handwritten text label for the plant below.



Handwritten text label for the plant below.



Horny Sea Shrub, Incrusted.



Flat Sea Shrub, with numerous Branches.

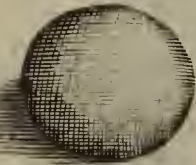


Cats-Tail Sponge.

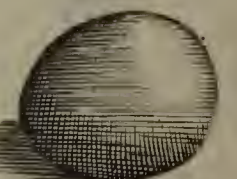


After the Life

Orbicular Indian Peas.



Another some-what Flat.



Sea Shrub with united Branches.



Fig. 1. *Scaphium* *sp.*
Linn.



Fig. 2. *Scaphium* *sp.*
Linn.

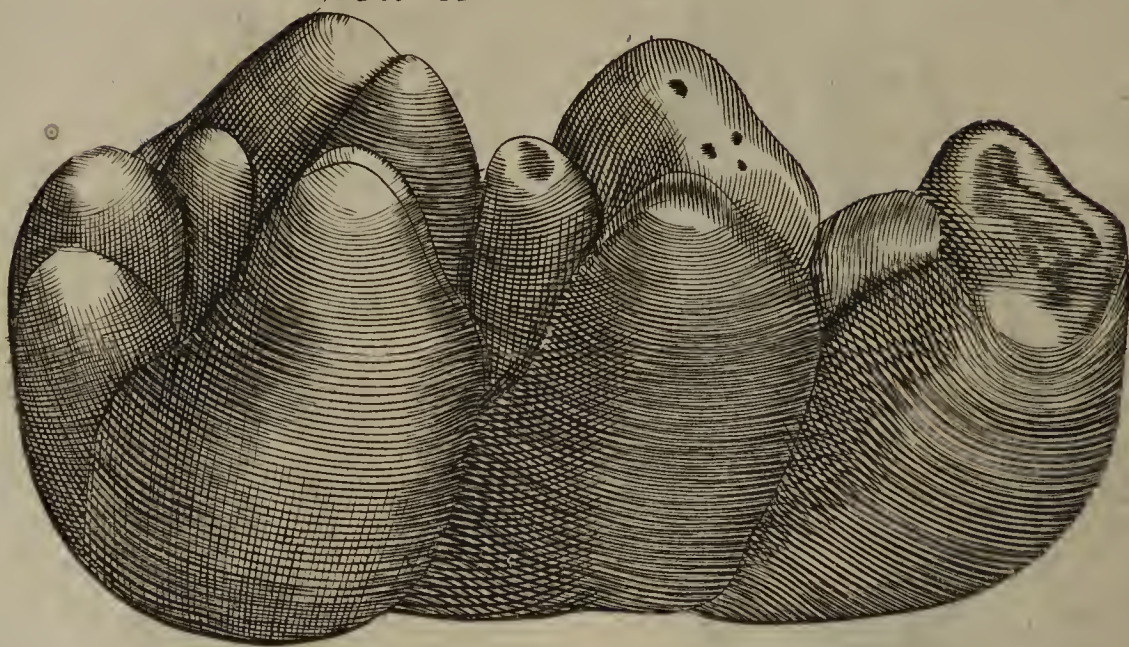


Fig. 3. *Scaphium* *sp.*
Linn.

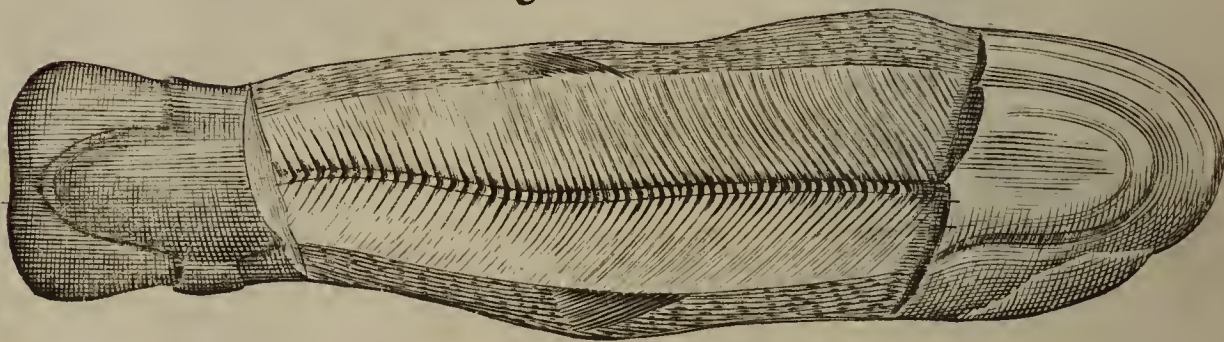


Tab. 19.

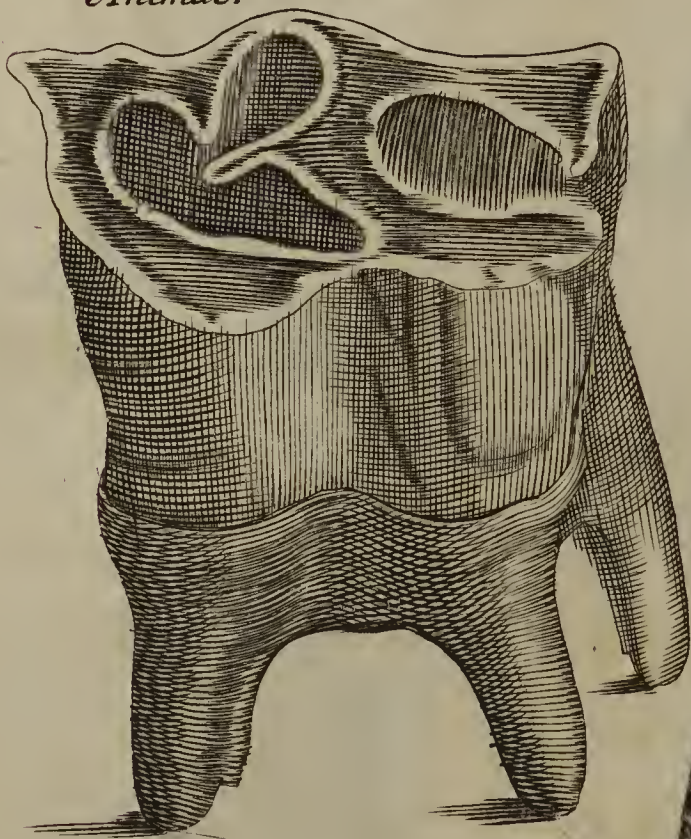
*Petrify^d Tooth of a
Sea Animal.*



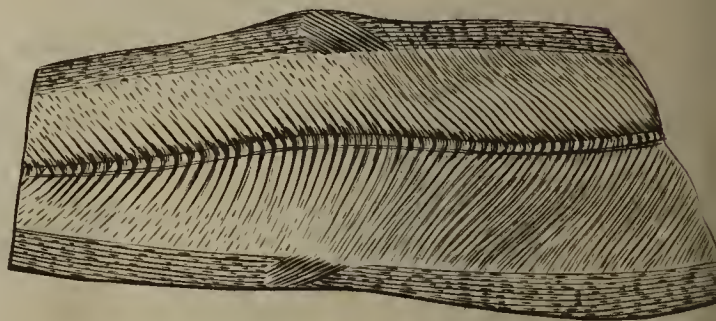
A Fish Mold 1.



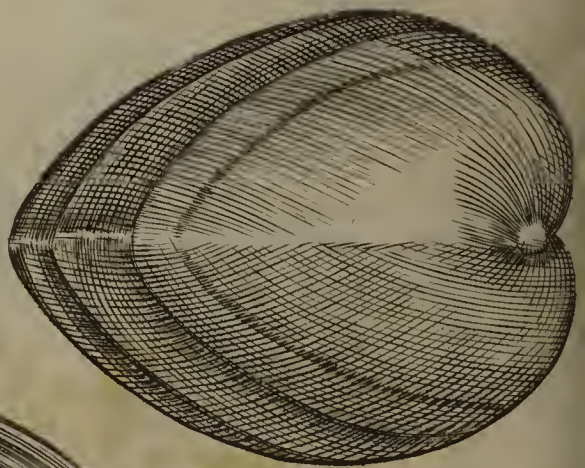
*P. Toot^h of a Land
Animal.*



2.



Cardites.



High-war'd Conchites.



*Quadrilateral
Musculites.*



Tab. 20.

Florid Coral.



Shell'd Belemnites.



Flat Bolt-head



True lechi-



Ste-tes.

Stones like Flower-Columns



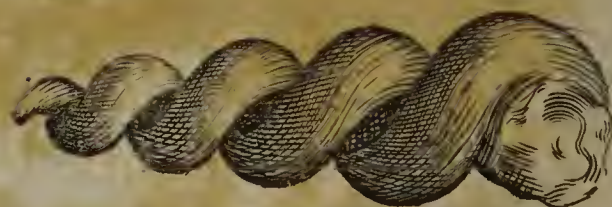
Dendropotamites.



Geometrick Jasper



Florid Eagle Stone.



Worme-stone

map road.



mountain



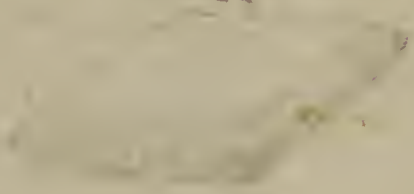
mountain



mountain



mountain



mountain



Tab. 21.

Astroclites



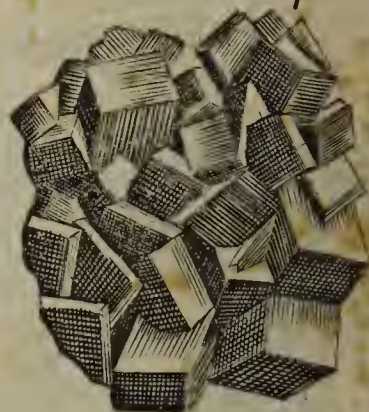
Silver-Spar.



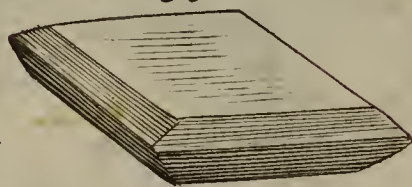
Foliated Talk.



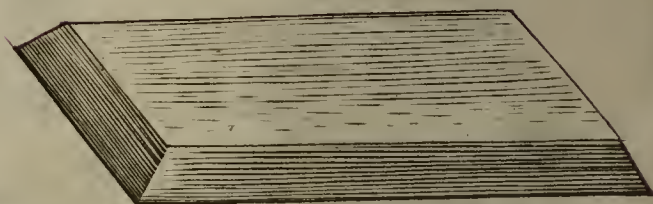
Mundick. Spar.



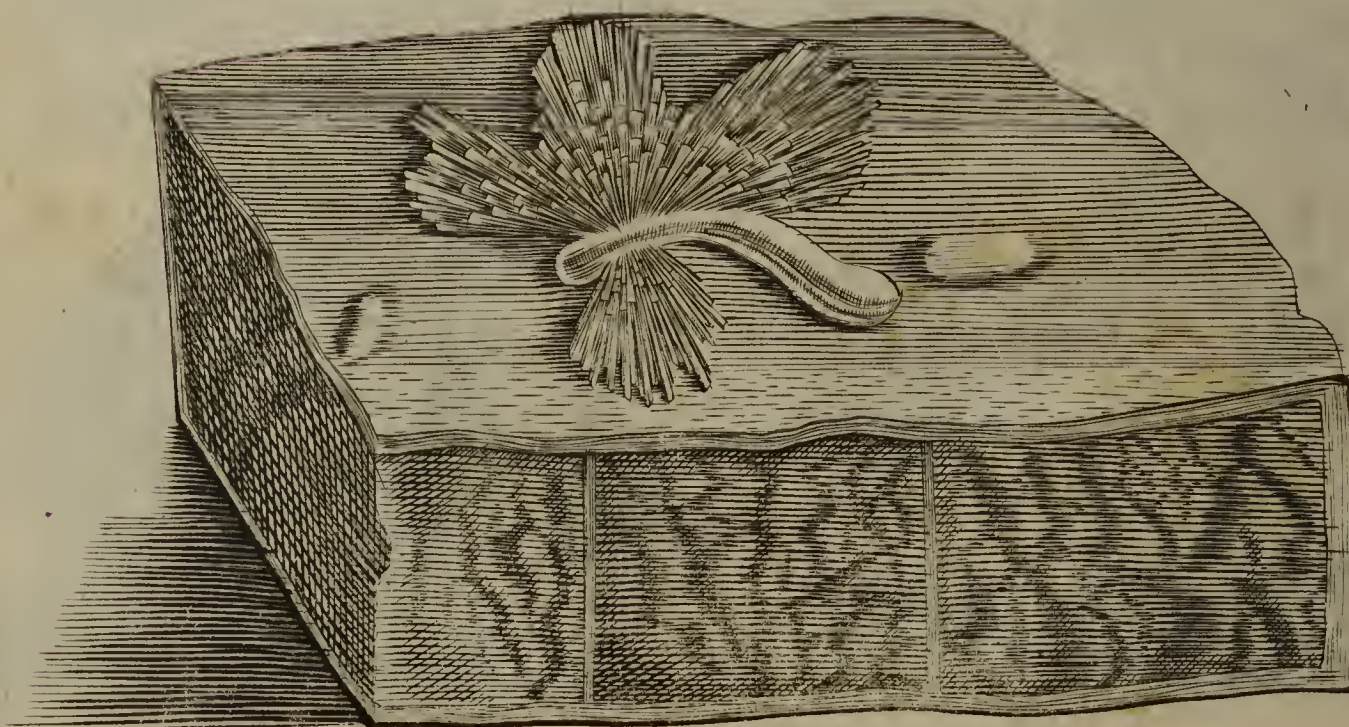
A Talk-Crystal



A Half Crystal



Starred Waxen-Vain



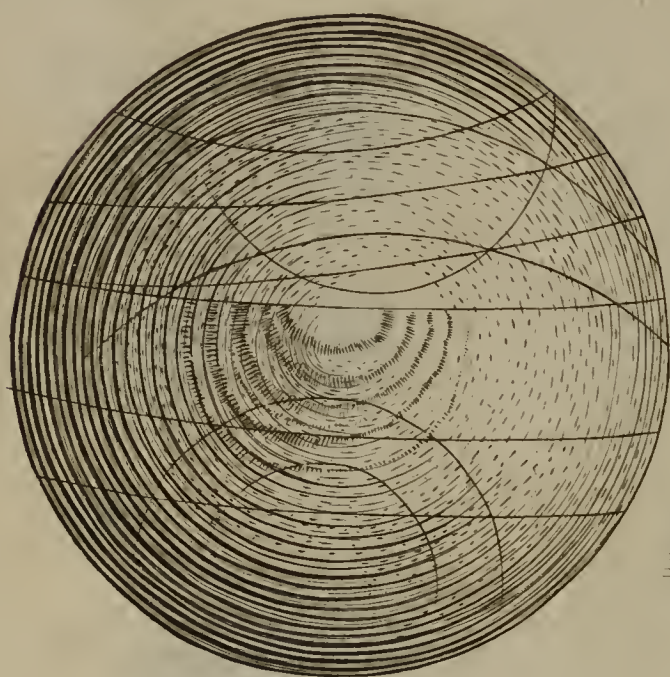
1847

March 1st

March 1st

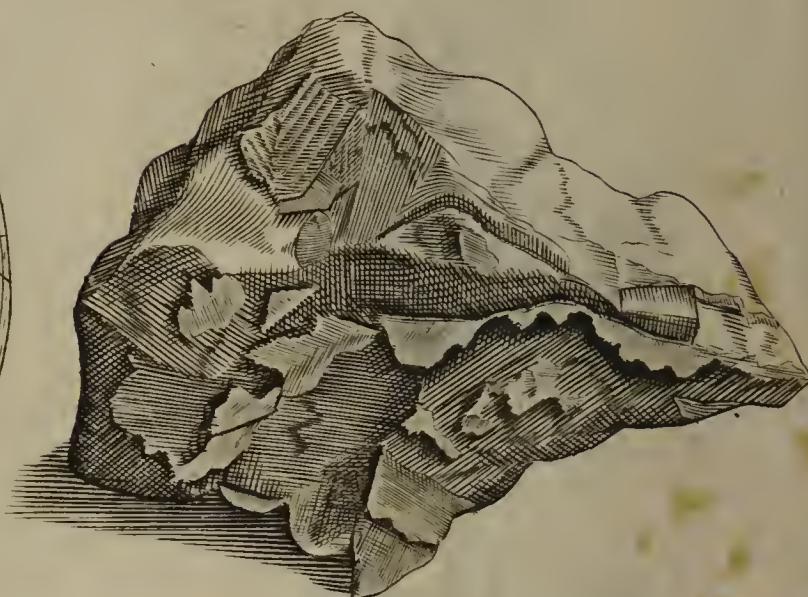


Onychine Marble



Plated Silver

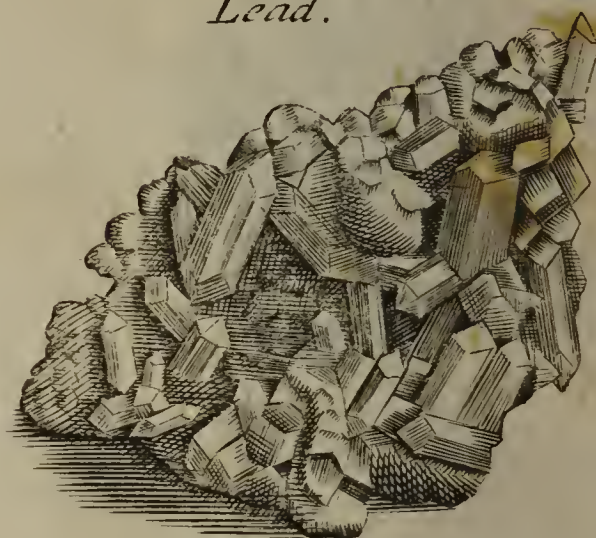
Tab. 22.



*Copper both Capillary
& Gravulated*



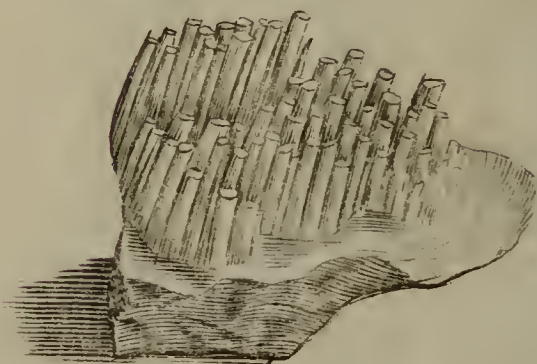
*Crystalline or Figurd
Lead.*



Brush - Iron Ore.

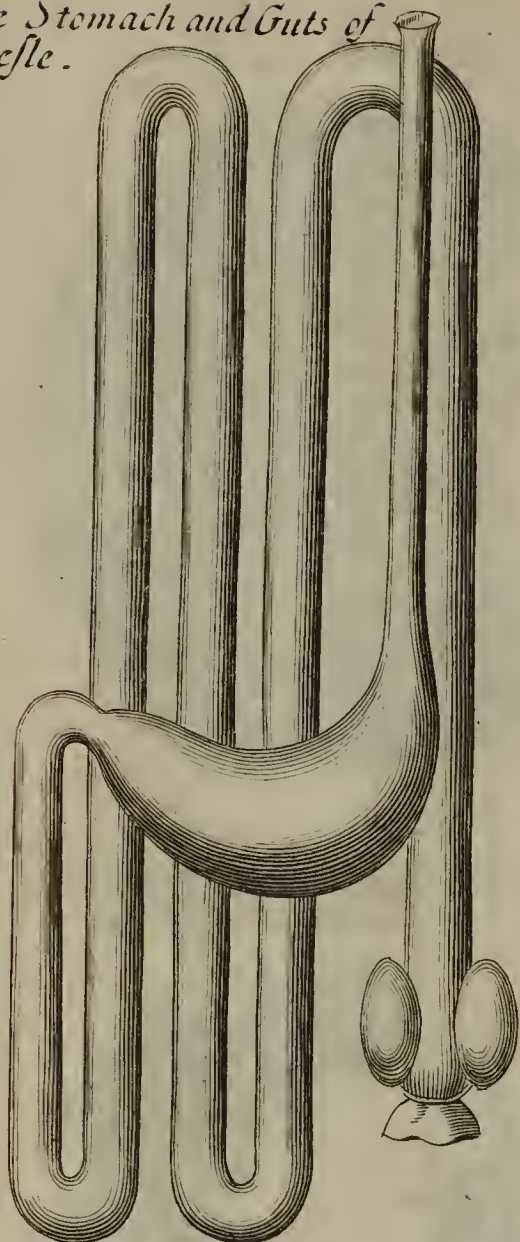


Brush Iron

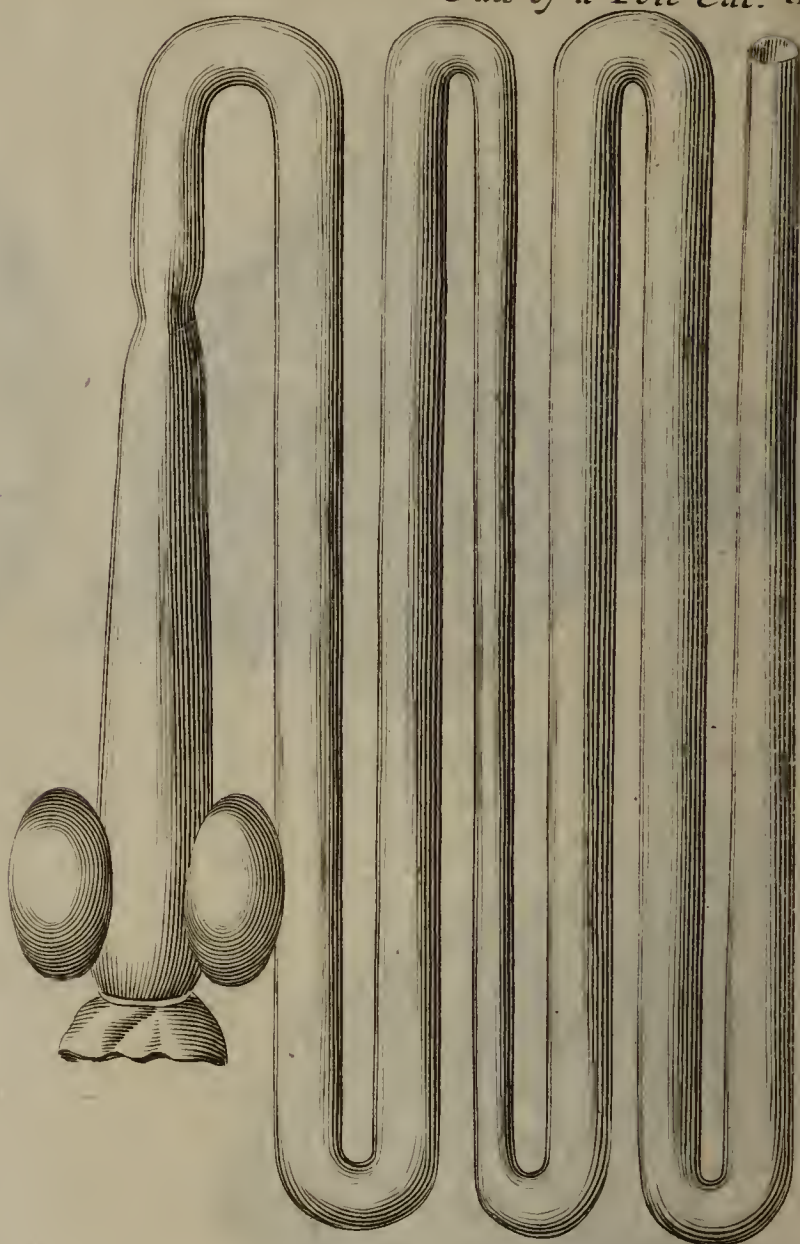




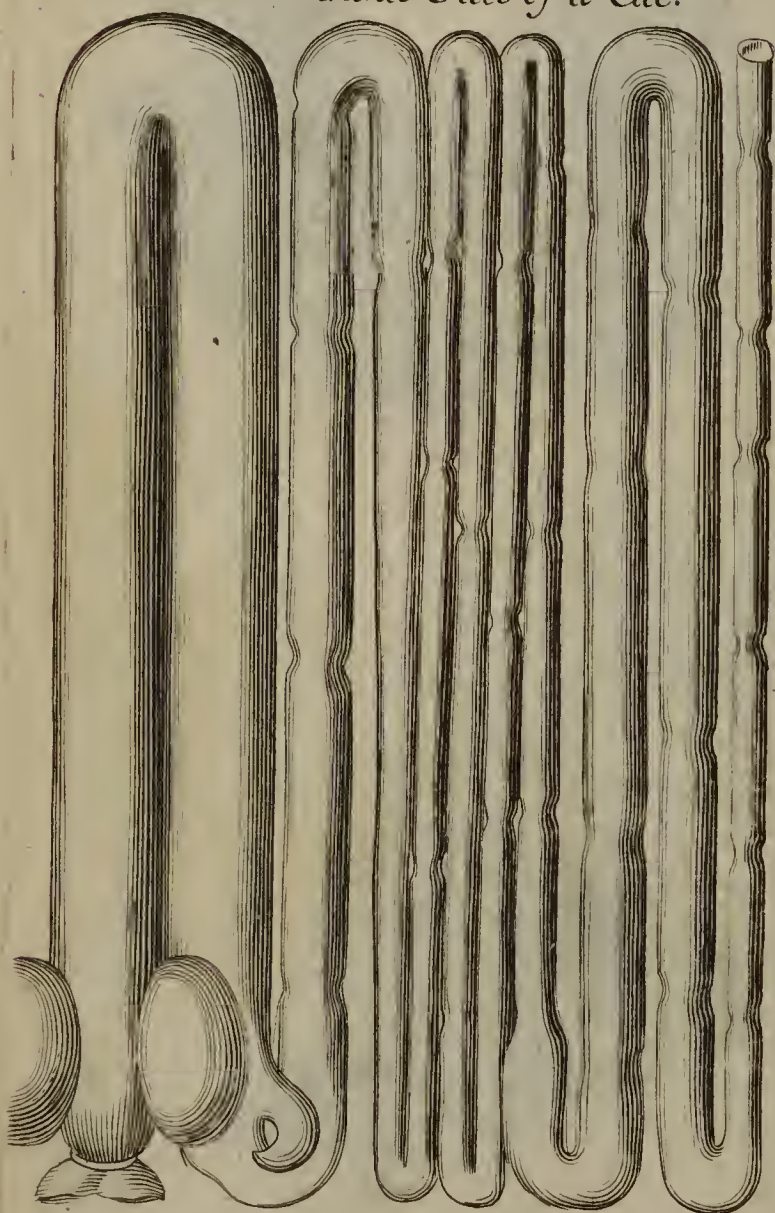
*The Stomach and Guts of
a Weefle.*



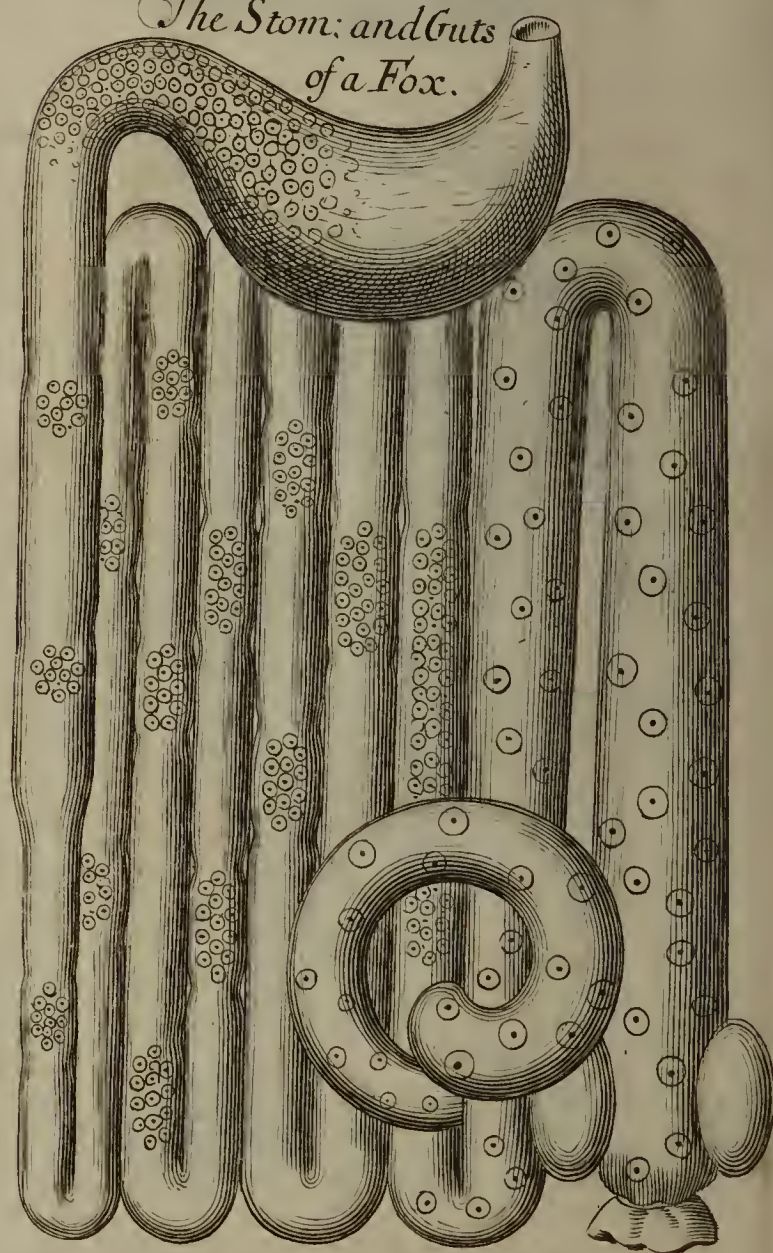
The Stom: and Guts of a Pole Cat. TAB: 23



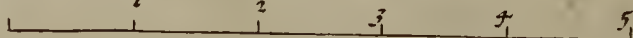
The Stom: and Guts of a Cat.



*The Stom: and Guts
of a Fox.*

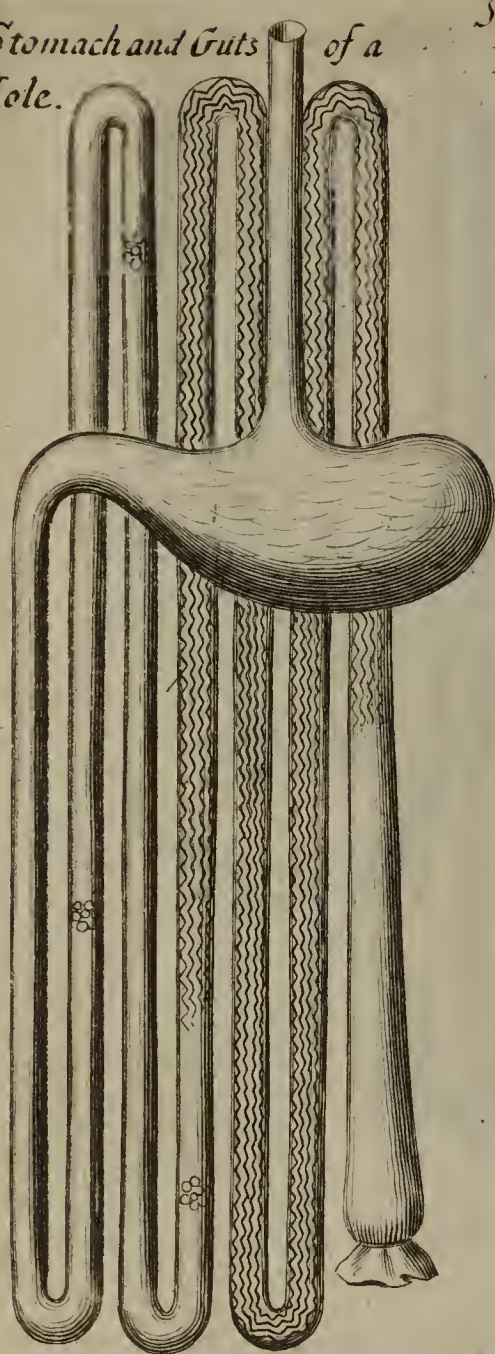


Inches

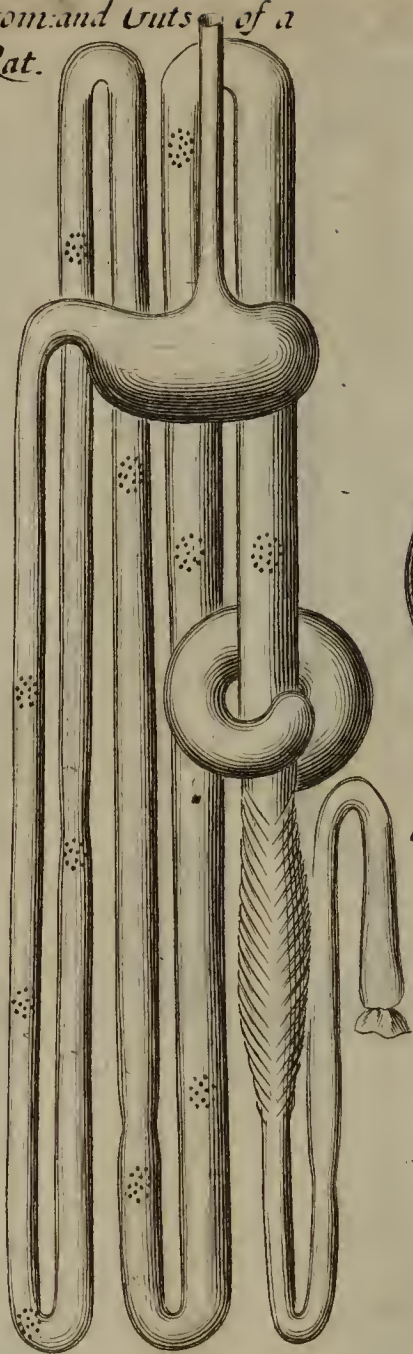




Stomach and Guts of a Mole.



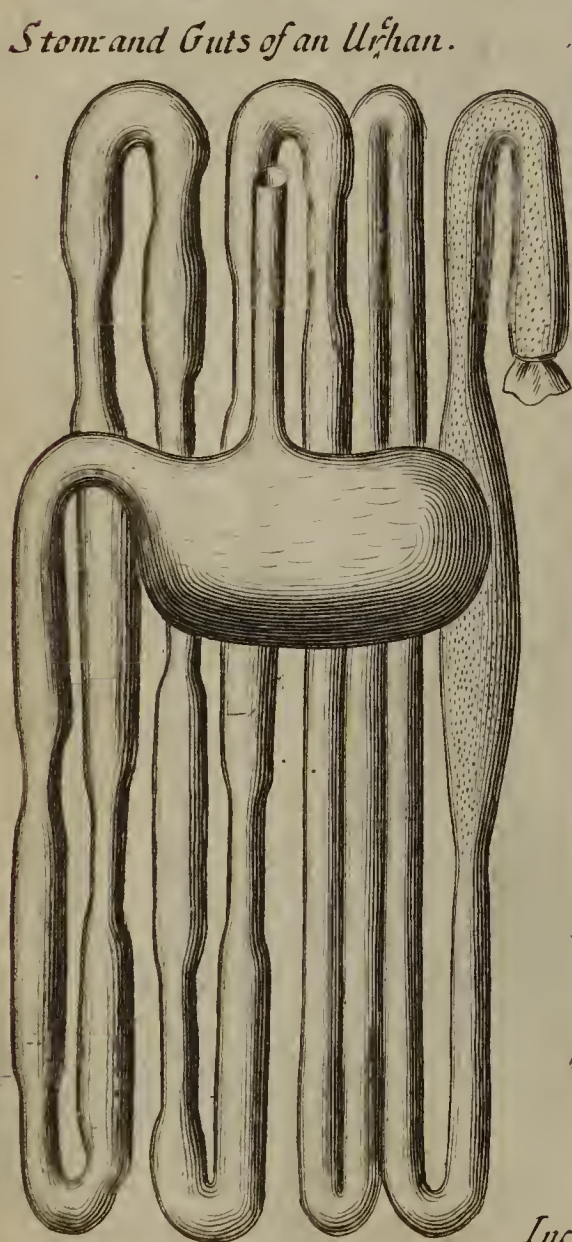
Stom. and Guts of a Rat.



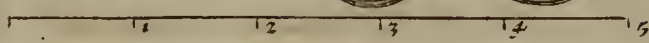
Stom. and guts of a Rabbit.



Stom. and Guts of an Urhan.



Inches.

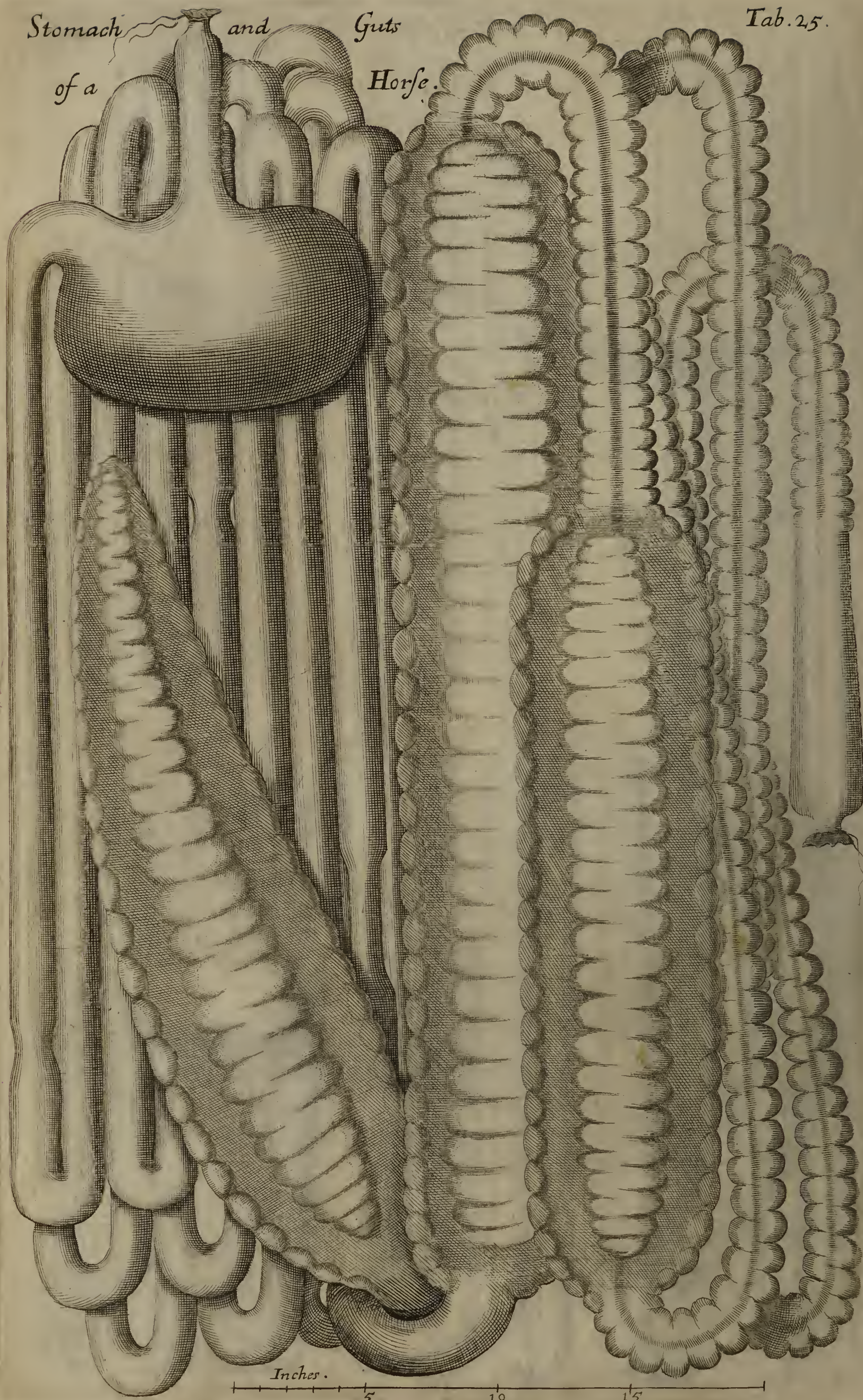


Journal

[Faint, illegible handwriting in cursive script, likely a journal entry. The text is mostly obscured by fading and bleed-through from the reverse side.]

Stomach and Guts
of a Horse.

Tab. 25.



Inches.

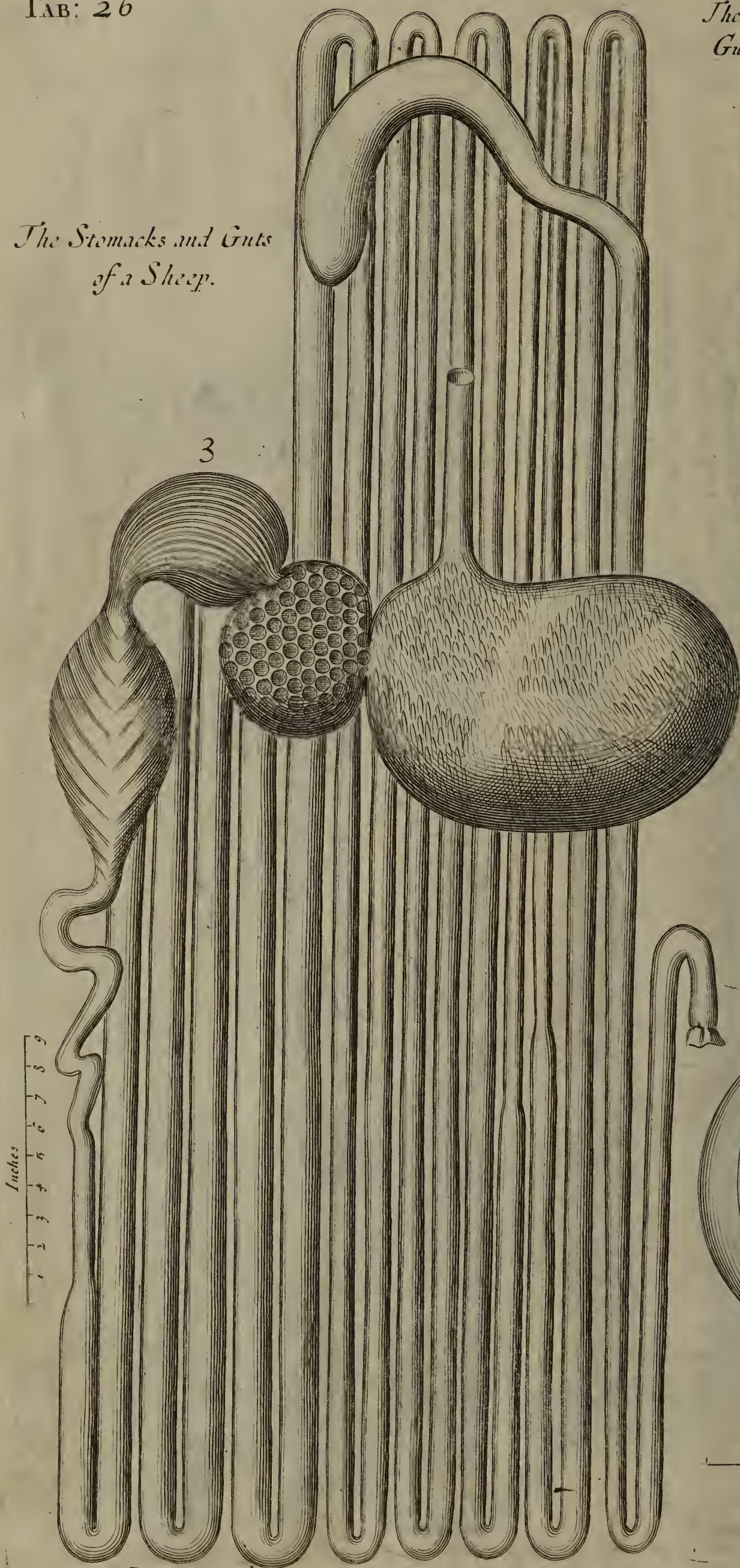
5

10

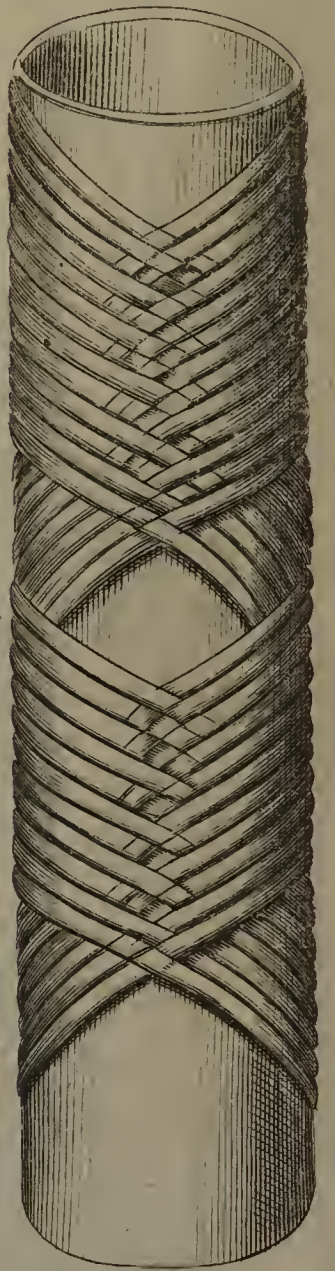
15



*The Stomacks and Guts
of a Sheep.*



*The Muscles of the
Gullet of a Calf
after the Life.*



*The Omasus or
Fecck of a Sheep*

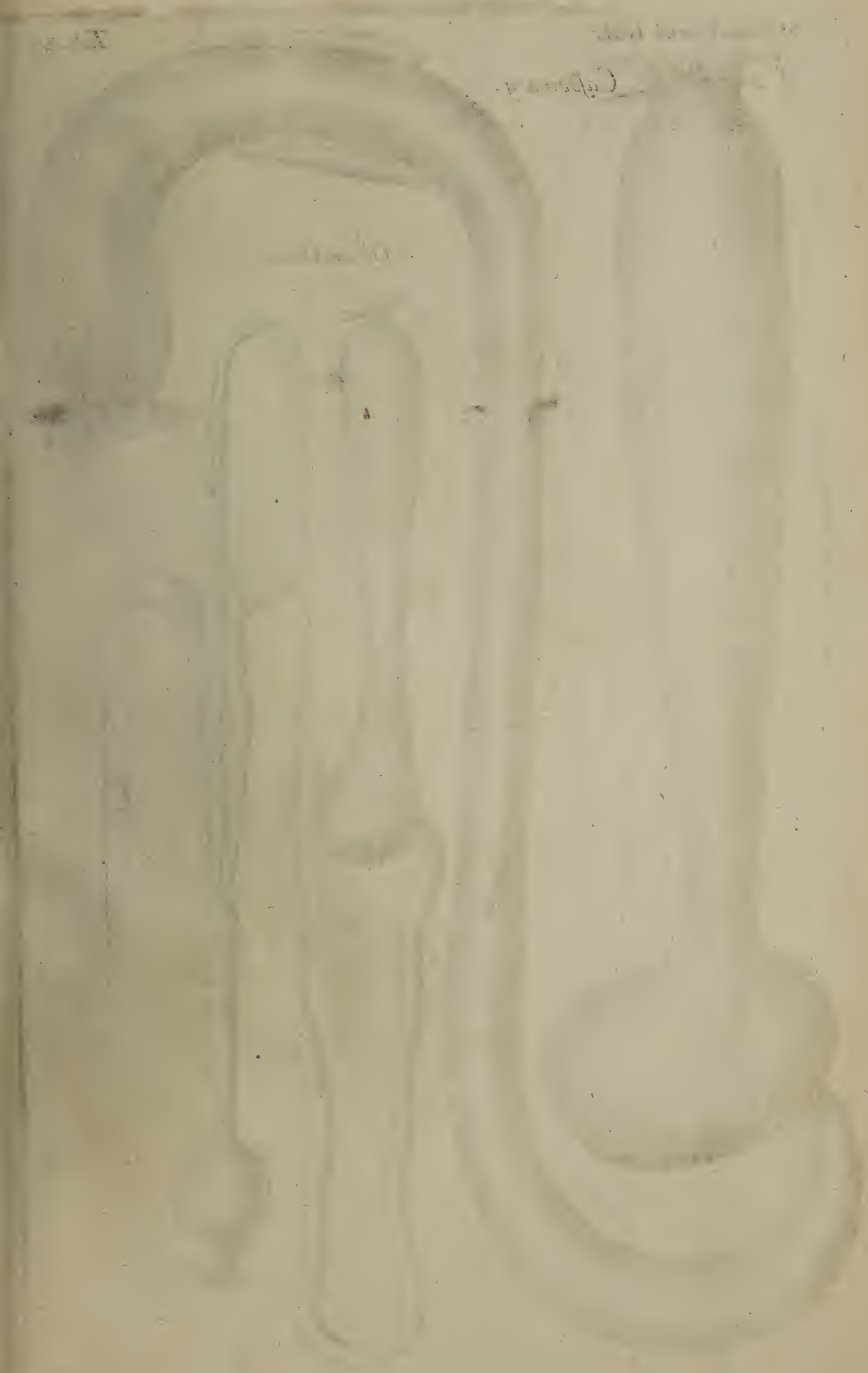


108

108

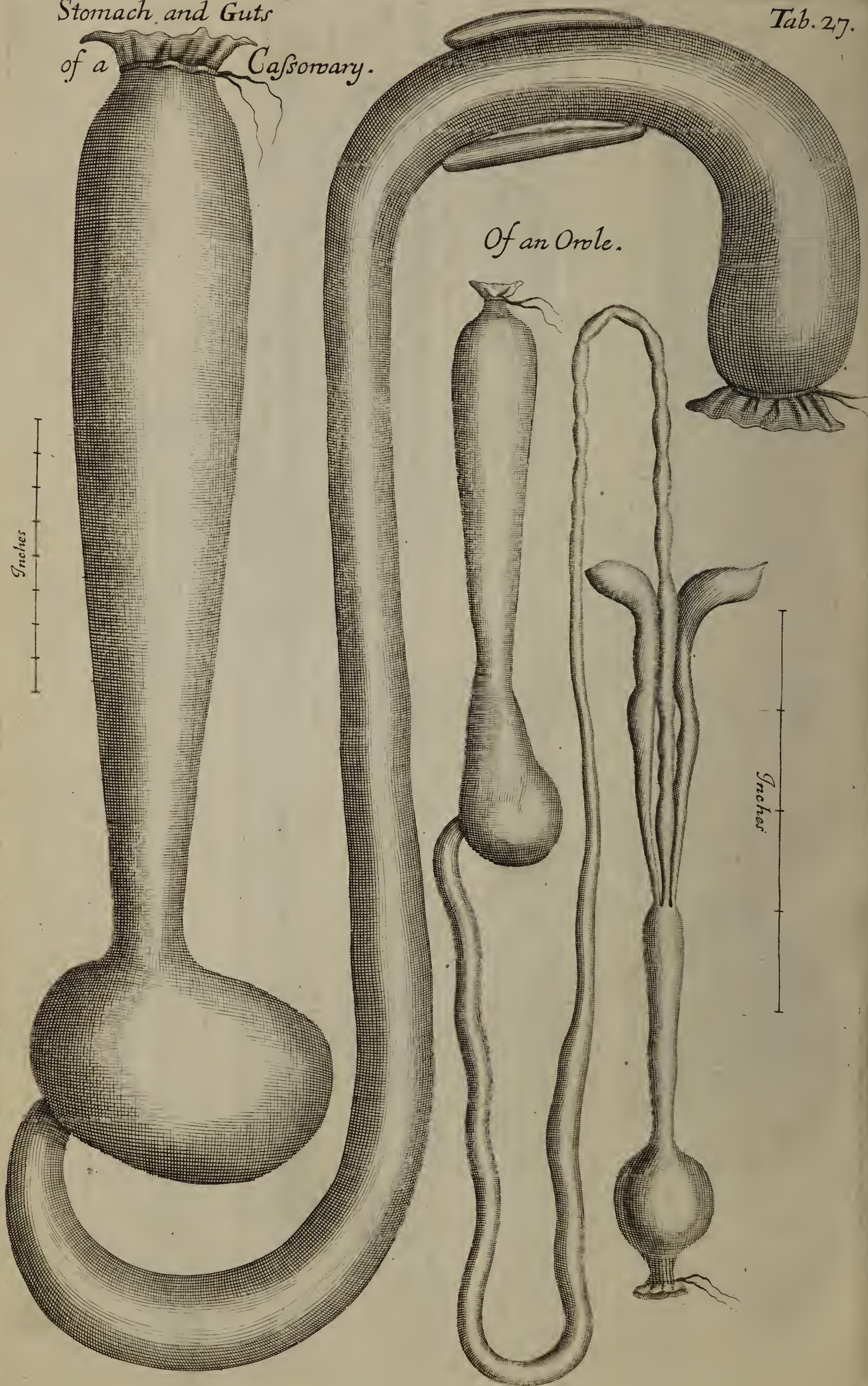
108

108



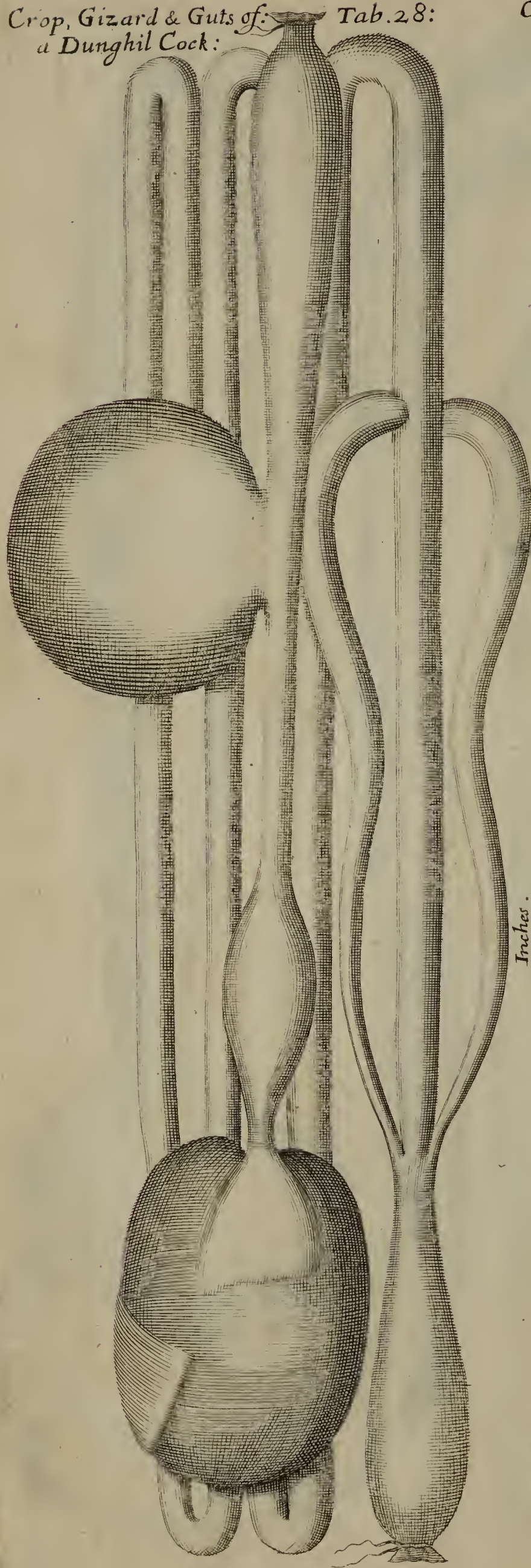
*Stomach and Guts
of a Cassowary.*

Tab. 27.

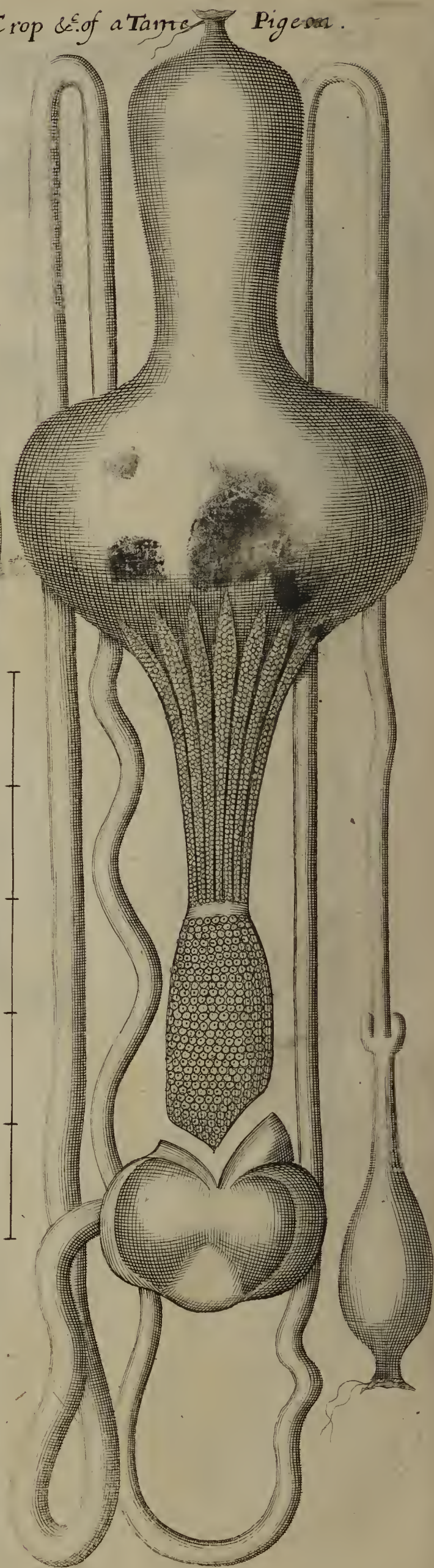




Crop, Gizzard & Guts of:
a Dunghil Cock: Tab. 28:

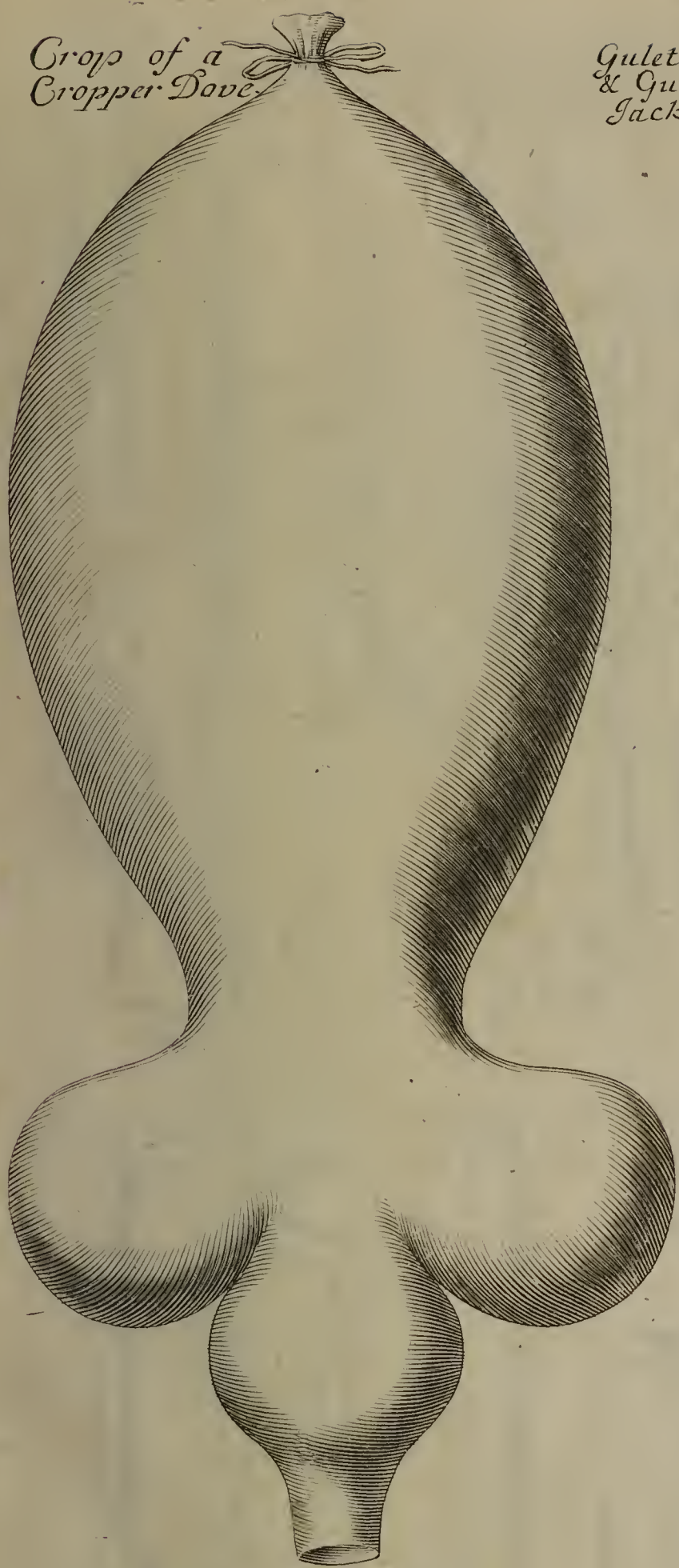


Crop & of a Tame Pigeon.

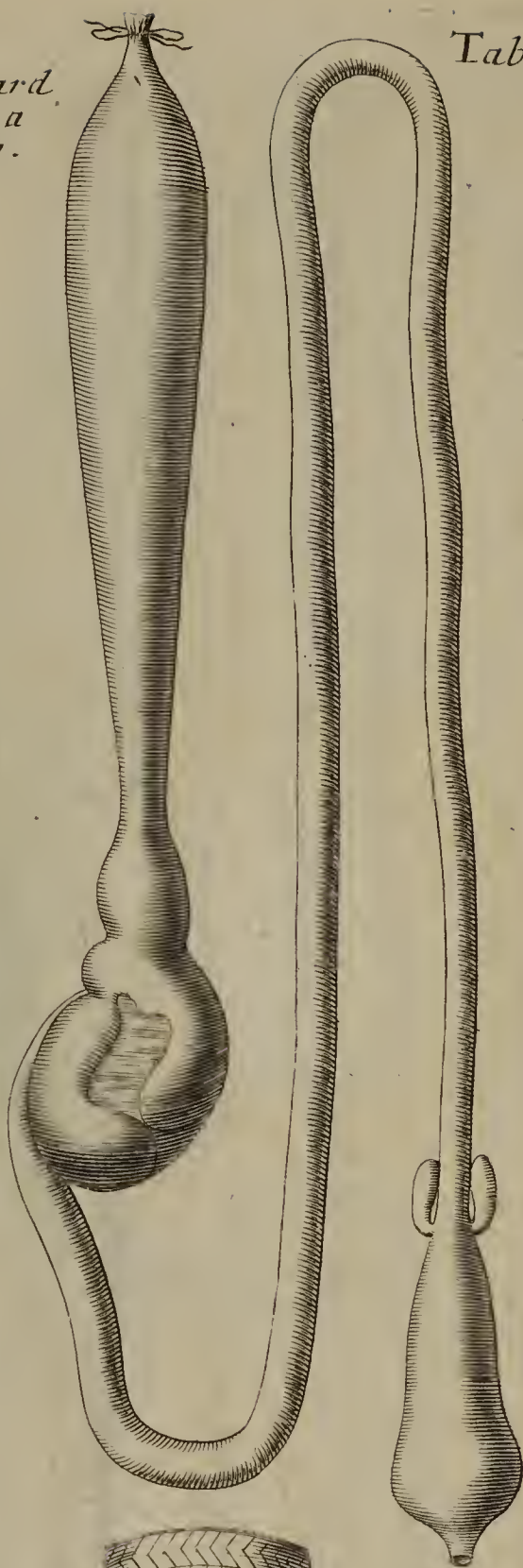
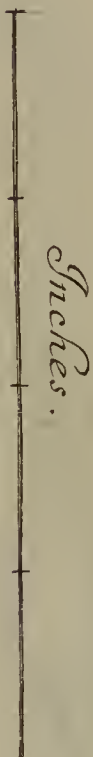


Inches.

Crop of a
Cropper Dove.

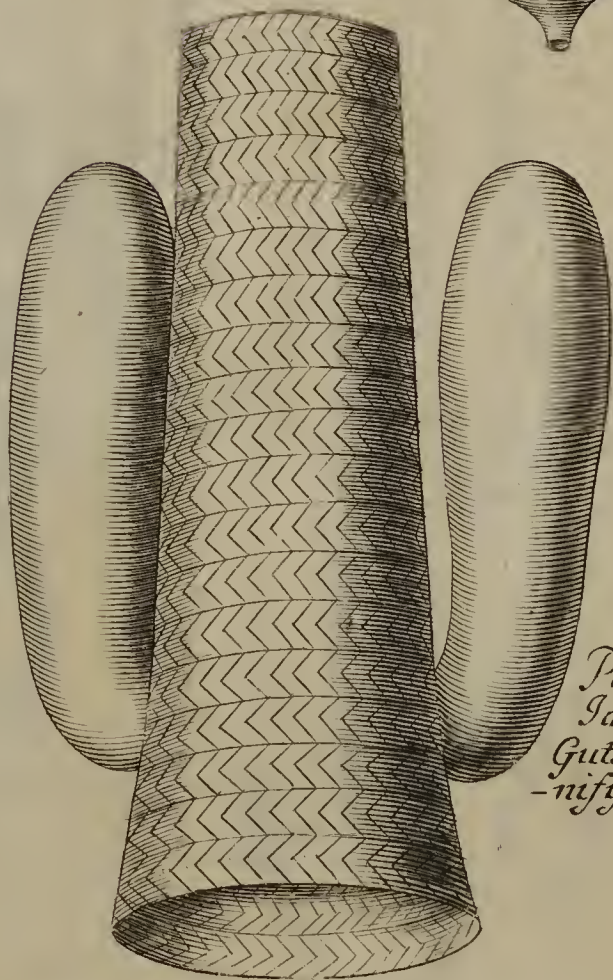
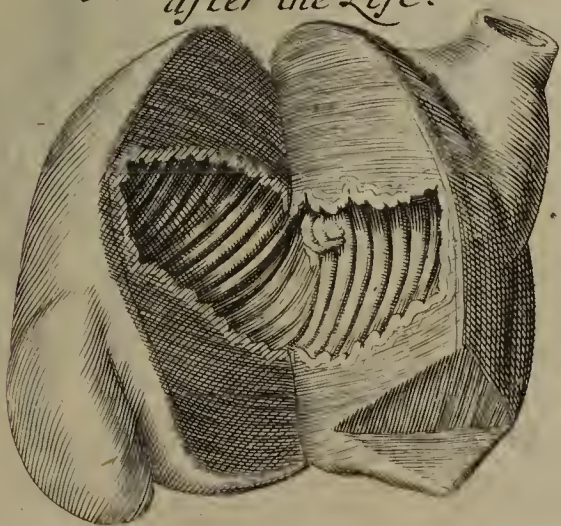


Gullet Gizzard
& Guts of a
Jack Daw.



Tab. 29.

Gizzard of a Pullet
after the Life.



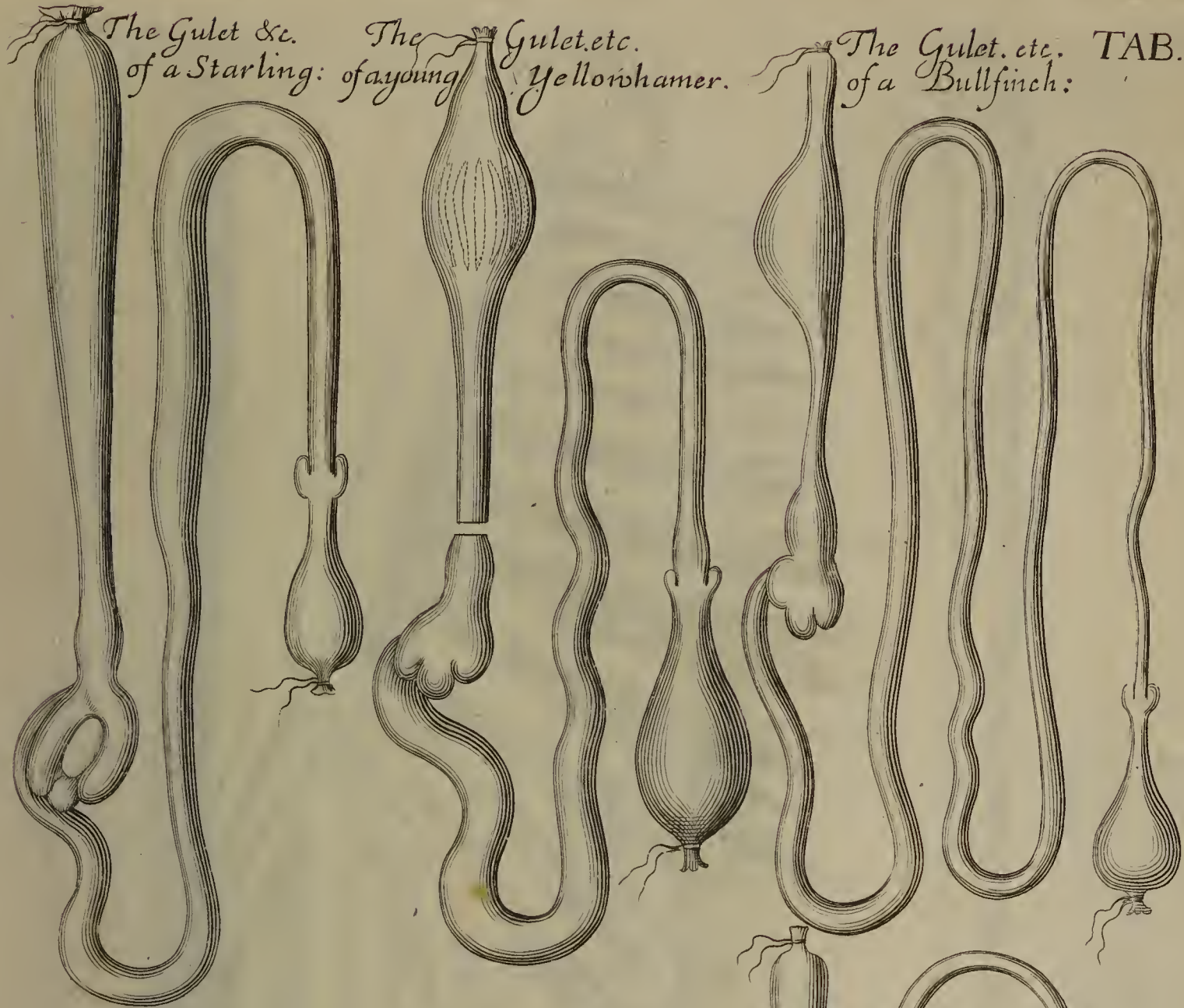
Part of a
Jack Daw's
Guts Mag-
nified.

100. A. 11

100. A. 11

100. A. 11

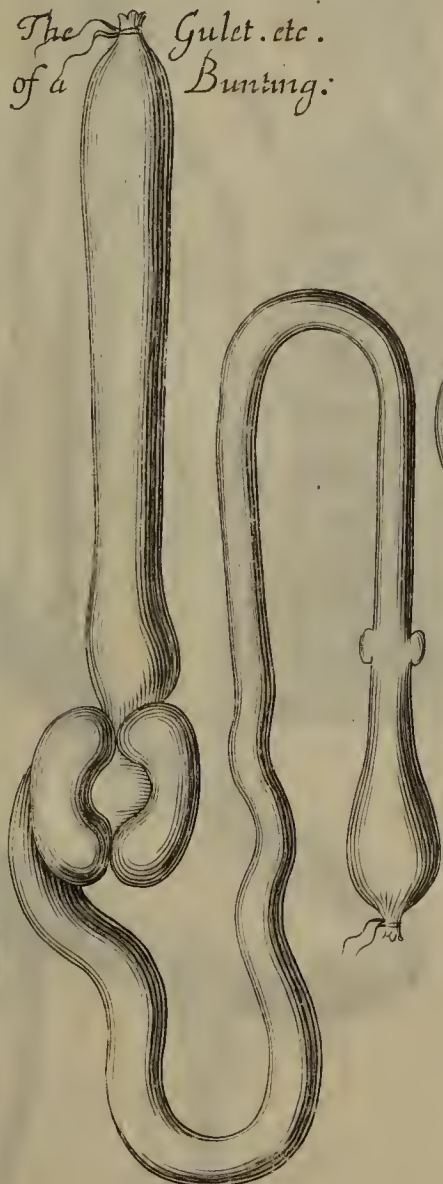
The Gullet &c. of a Starling: of a young Yellowhammer. The Gullet, etc. of a Bullfinch: TAB. 30.



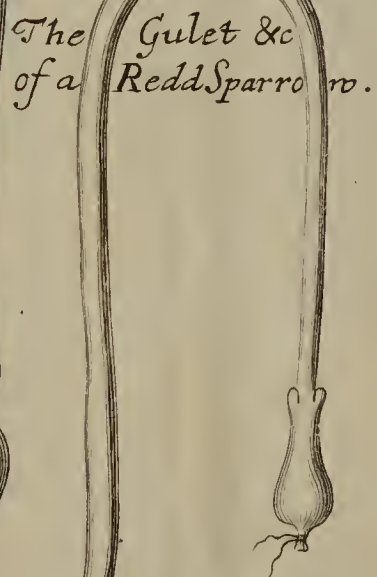
The Gullet, etc. of a young Wryneck:



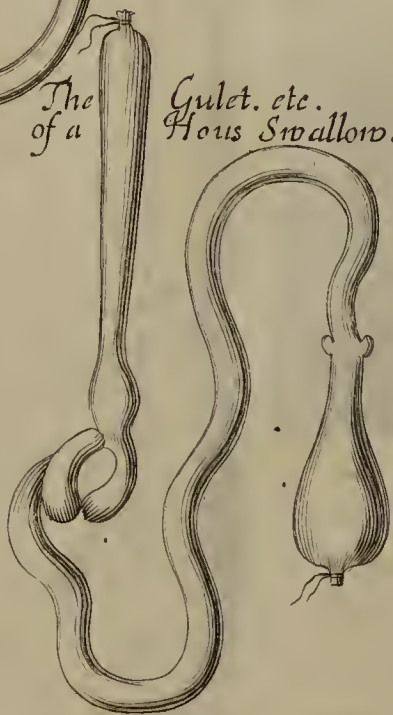
The Gullet, etc. of a Bunting:



The Gullet &c. of a Redd Sparrow.



The Gullet, etc. of a House Swallow.



173 (100) (100)

174 (100) (100)

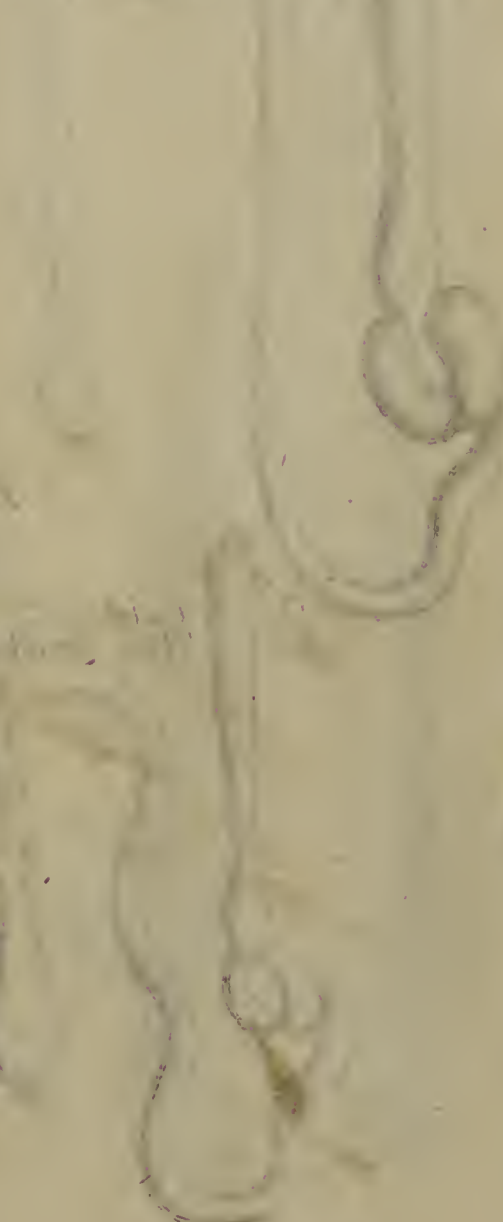
175 (100) (100)



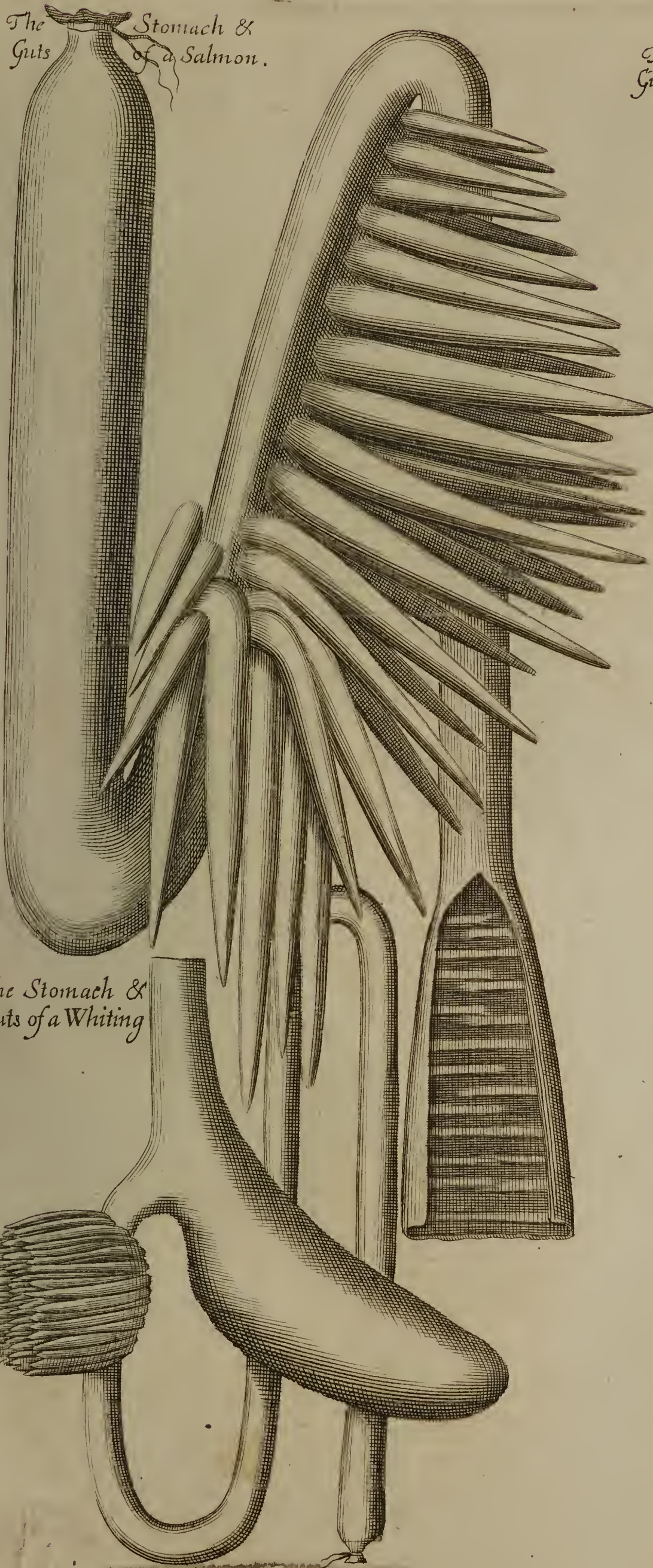
176 (100) (100)

177 (100) (100)

178 (100) (100)



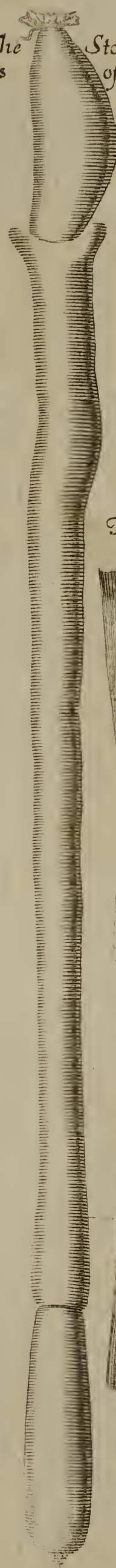
The Stomach & Guts of a Salmon.



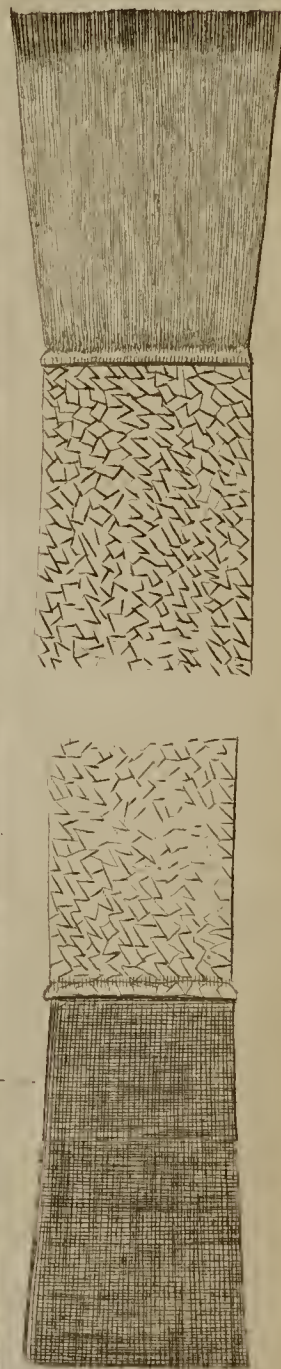
The Stomach & Guts of a Whiting

TAB. 31.

The Stomach & Guts of a Plac.



The Inside.





B
2

